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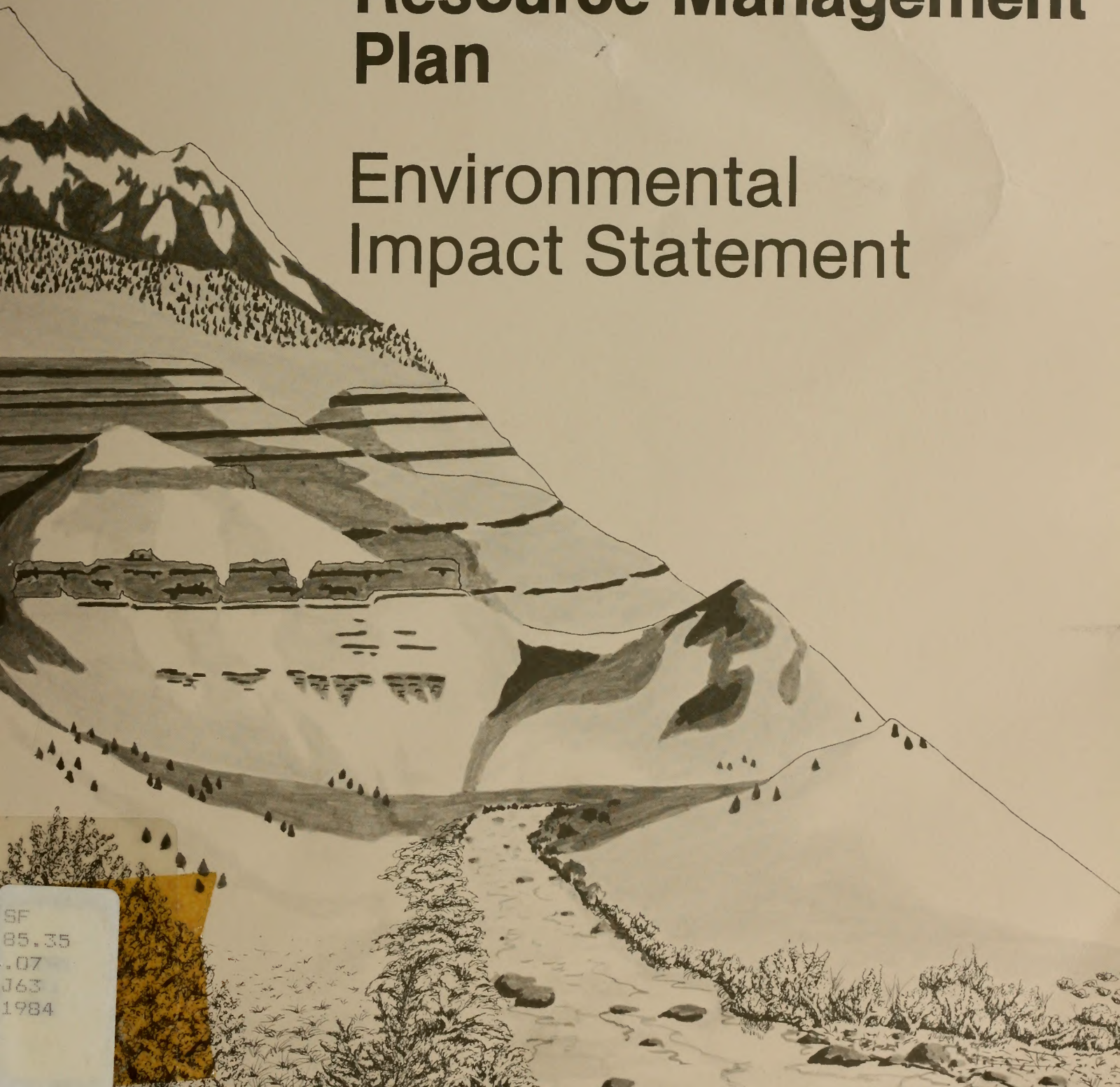
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management

Draft

Burns District Office
74 South Alvord
Burns, Oregon 97720

John Day Resource Management Plan

Environmental Impact Statement



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United States Department of the Interior

BUREAU OF LAND MANAGEMENT

BURNS DISTRICT OFFICE June 14, 1984
74 S. Alvord Street
Burns, Oregon 97720

Dear Reader:

This draft Resource Management Plan/Environmental Impact Statement (RMP/EIS) for the John Day Planning Area is presented for your review and comment. It will be the first RMP in Oregon and has been prepared in conformance with planning procedures established under the Federal Land Policy and Management Act of 1976.

This document outlines four major alternatives for the management of BLM's public land in the John Day Planning Area. These alternatives are designed primarily to address land management issues that were identified during the early stages of the planning process.

We would appreciate your comments on the adequacy of this RMP/EIS by September 13, 1984, for consideration in preparing the final John Day RMP/EIS. Questions or comments should be directed to Larry Morgan, Project Leader, Bureau of Land Management, Burns District Office, 74 South Alvord, Burns, Oregon 97720. Comments received after the close of the comment period may be considered in the decision process, even though they may be too late to be specifically addressed in the final environmental impact statement.

Two informal public meetings will be held during the 90-day public comment period for individual wishing to ask questions or to present comments. The meetings will be held at the following locations:

July 25, 1984	Harney County Courthouse 450 N. Buena Vista Burns, Oregon	7:00 to 9:00 P.M.
July 26, 1984	Grant County Courthouse Canyon City, Oregon	7:00 to 9:00 P.M.

BLM personnel will be on hand at both meetings to answer questions regarding the draft analysis and plan.

This draft document may be incorporated into the final EIS by reference. If so, the final RMP/EIS will consist of public comments, responses and any needed changes of the draft. Therefore, please retain this draft copy for use with the final RMP/EIS.

The final RMP/EIS will identify the changes, if any, in the Preferred Alternative (Proposed Action). It should be considered a proposed decision at that time. It will be subject to a special review opportunity by the Governor of Oregon and protest by parties who may be adversely affected.

Through your participation in this planning process, we believe we can move together toward a common goal of improved public land management in the John Day Planning Area.

Sincerely yours,

Joshua L. Warburton
District Manager

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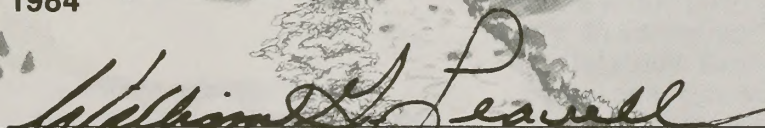
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JOHN DAY RESOURCE MANAGEMENT PLAN

ENVIRONMENTAL IMPACT STATEMENT

Prepared By
**BURNS DISTRICT OFFICE
BUREAU OF LAND MANAGEMENT
U.S. DEPARTMENT OF THE INTERIOR
1984**



State Director, Oregon State Office



District Manager, Burns District

John Day Resource Management Plan and Environmental Impact Statement

Draft (X) Final () RMP/EIS Department of the Interior, Bureau of Land Management

1. Type of Action: Administrative (X) Legislative ()

2. Abstract: This Draft Resource Management Plan/Environmental Impact Statement discusses resource management on 182,120 acres of public lands administered by the Bureau of Land Management in the Burns District. The Preferred Plan proposes to implement harvesting of timber on 32,242 acres with a sustained yield of 2.17 MMbf; grazing management would continue on 180,096 acres (157 allotments) of public land with an expected long-term, slight increase in grazing use; wild horse numbers would be maintained at present levels, wildlife and fish habitat would be maintained or improved, and at least 5,240 acres of public land would be offered for sale.

3. Four alternatives are analyzed:

- A. Preferred
- B. Emphasis on Production of Commodities
- C. Emphasis on Enhancement of Natural Resources
- D. No Action (continuation of the existing land management program)

4. The comment period will be 90 days, ending September 13, 1984.

5. For further information contact:

Larry Morgan, RMP/EIS Team Leader
Bureau of Land Management, Burns District Office
74 South Alvord
Burns, Oregon 97720
Telephone (503) 573-5241

Summary

Four multiple use alternatives for the management of public lands in the John Day Planning Area have been developed and analyzed in accordance with the Bureau's planning regulations issued under authority of the Federal Land Policy and Management Act of 1976. The alternatives respond to three major issues: Forest Management, Forage Use and Land Ownership Adjustment, identified through the planning process. The purpose of the proposed alternatives is to present and evaluate options for managing, protecting and enhancing public resources.

Each alternative is a master plan that would provide a framework within which future, more site-specific decisions would be made, such as defining the intensity of management of various resources, developing activity plans (e.g., grazing allotment management plans and transportation plans) or issuing rights-of-way, leases or permits.

The four alternatives considered are:

A. Preferred Alternative

The Preferred Alternative would emphasize the management, production, and use of renewable resources on the majority of the public lands in the John Day RMP area. Management would be directed toward providing a flow of renewable resources from the public lands on a sustained yield basis. This alternative represents the Bureau's favored management approach.

Grazing permits would be authorized at the 1982 total preference level of 25,323 AUMs. There would be 14 management systems developed, maintained or revised for I category allotments which comprise 47 percent of the grazing lands and 51 percent of the total preference AUMs.

There would be 30,962 acres of commercial forestland on which the sustained harvest level is based. The sustainable harvest level would be approximately 2.17 MMbf annually or 21.7 MMbf for a ten year period. Minor forest products would be sold where consistent with other resource values.

Forage availability for wildlife and wild horses would continue at current levels except for bighorn sheep. The wild horse Herd Management Area (HMA) would be reduced in size, but the planned herd size would remain at 100 animals. Livestock grazing adjacent to 28.5 stream miles in I category allotments would be coordinated to enhance fish habitats. Vegetation manipulation and

implementation of water developments would occur to improve fish and wildlife habitat, primarily big game habitat. Instream structures would be developed along 55 miles of stream supporting anadromous fisheries. A fish ladder would be constructed to open up 85 miles of streams to anadromous fish.

There would be 5,240 acres identified for disposal with an additional 16,000 acres identified for further study. Exchanges and transfers to other federal agencies would take place when natural resource values would benefit.

B. Emphasize Production of Commodities Alternative

This alternative would emphasize providing economic benefits to the local economy. Multiple use management would emphasize the production of goods and services on public lands within the John Day RMP area to meet local and possibly regional demands.

On grazing permits within I category allotments there would be a slight increase in authorized grazing use. Livestock grazing would be allowed throughout the planning area but grazing use within I category allotments would be managed according to activity plans.

There would be 31,609 acres of commercial forestland on which the sustainable timber harvest level is based. The sustainable harvest level would be 2.21 MMbf annually or 22.1 MMbf for the decade. The sale of minor forest products would be optimized.

Forage use for wildlife would continue at current levels except for bighorn sheep. Wild horse use on public land would be reduced or excluded focusing horse use in normal years on National Forest lands. A wild horse winter use area would be established for use in hard winters. There would be construction and development of fresh water impoundments to provide cold and warm water fisheries.

There would be 21,014 acres identified for disposal with an additional 16,000 acres identified for further study. Exchange and transfers to other federal agencies would take place when natural resource values would benefit.

C. Emphasize Enhancement of Natural Resources Alternatives

This alternative would emphasize protection, maintenance and enhancement of the natural

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environment within the planning area. The enjoyment and use of the natural environment for present and future generations, both locally and nationally, would be emphasized.

On grazing permits within I category allotments there would be a 25 percent decrease in livestock use over the short term. An additional decrease in livestock use would occur over time as wild horse use increases. Range developments would be implemented where appropriate to meet other resource needs. Livestock grazing would be restricted or excluded from 76 miles of streamside riparian zone through management or fencing of affected allotments.

There would be 18,867 acres of commercial forestland on which the sustainable timber harvest level is based. The sustainable harvest level would be 1.32 MMbf annually or 13.2 MMbf for the decade. Multiple use constraints and set-asides would be expanded. Old growth values would be preserved. Sales of woodland products would be restricted to protect other resource values.

Forage availability to wildlife would continue at current levels in the short term except for bighorn sheep. Forage used by wild horses would receive a maximum increase to 5,061 AUMs over time and the HMA would remain at present size. Livestock grazing would be restricted or excluded from 76 streamside miles of riparian zone through management or fencing of affected allotments. Instream structures would be developed in 55 miles of stream supporting anadromous fisheries. A fish ladder would be constructed to open up 85 miles of streams to anadromous fish.

Under this alternative no lands would be identified for disposal. Ownership adjustments would function through an active exchange program that would emphasize protection, maintenance and enhancement of the natural environment.

D. No Action Alternative

This alternative allows for the management and flow of outputs from the public lands and resources in the planning area at their present levels. The planning area is presently operating under a 1974 Management Framework Plan (MFP) and formal management direction is derived from the MFP with on-the-ground actions following an interdisciplinary analysis process.

Grazing permits would continue to be issued at the 1982 total preference level of 25,323 AUMs. Activity plans would be maintained or revised as needed. Constraints upon the grazing program would be minimal and primarily would be reflected

in implementation of activity plans. Riparian restrictions would be based upon previously proposed or existing pastures and existing exclosures.

There would be 31,433 acres of commercial forestlands on which the sustainable harvest level is based. The annual sustainable harvest level would be 2.20 MMbf or 22.0 MMbf for the decade. Woodland products would be utilized based upon demand.

Forage availability to wildlife and wild horses would continue at current levels. Constraints on timber harvesting to protect big game habitat would be based on existing constraints and set-asides. Wildlife developments would be implemented for big game and fish habitat.

There would be 36,779 acres identified for disposal and no acres have been identified for further study.

Table 1 Comparison of Alternatives: Summary of Allocations/Outputs by Issue

Issue	Unit of Measure	Alt. A Preferred	Alt. B Production	Alt. C Enhancement	Alt. D No Action
Forest Management					
Total Commercial Forest Set Aside	acres	1,828	1,451	8,072	1,532
Yield ⁴	MMbf	2.17	2.21	1.32	2.20 ⁵
Forage Allocation					
Riparian Habitat Management					
Improved Riparian Habitat	Miles	28.5	28.5	76.0	28.5
Short Term					
Livestock Forage New/Revised	AUMs	25,323	25,872	21,023	25,323
AMPs/CRMPs	No.	14	14	14	2
Range Improvement Costs	\$	431,220	470,000	183,000	91,000
Big Game Forage ¹	AUMs	500	500	500	500
Wild Horse Forage ¹	AUMs	240	-0-	5,301	240
Bighorn Sheep	AUMs	192	192	192	96
New/Revised Activity Plans (Wildlife, Wild Horses, Forestry)		11	11	11	3
Long Term					
Livestock Forage ³	AUMs	25,734	27,381	21,023	23,323
Big Game Forage	AUMs	500	500	500	500
Wild Horses	AUMs	240	-0-	5,301	240
Bighorn Sheep	AUMs	360	360	360	360
Land Ownership Adjustments (By Sale)					
Disposal Category	Public				
	Acres	5,240	21,014	-0-	36,779
Further Study	Public				
	Acres	16,000 ²	16,000 ²	-0-	-0-

¹ Forage here meant to mean competitive forage on I category allotments.

² An additional 16,000 acres may be available depending on a case by case analysis of significant big game habitat and forestry considerations.

³ Long-term forage increases would occur on I category allotments only.

⁴ Yield is approximate, an accurate harvest yield will not be determined until FY 85.

⁵ This allocation reflects current information and is substantially lower than the existing situation of 48,818 acres forestland with a planned harvest level of 3.4 MMbf.

Environmental Consequences

Air Quality

Under all alternatives, impacts from particulate matter and visible smoke resulting from all activities would be very minor and temporary, and thus are not considered significant.

Soils

There would be a low beneficial impact under the Preferred, Production and Enhancement Alternatives due to the increase in the proportion of residual ground cover composed of perennial vegetation. The No Action Alternative would result in no change from the existing situation.

Road construction and timber harvest techniques can create soil compaction, soil disturbance and soil loss but they would be in proportion to the number of acres harvested. Adverse impacts to soil would be greatest under the Production, No Action and Preferred Alternatives and least under the Enhancement Alternative.

Water

No significant change in the quantity of runoff would occur under any of the alternatives. Road construction and logging would cause localized increases in sediment yield under all alternatives, but most significantly under the Preferred, Production and No Action Alternatives. Overall sediment yield related to timber harvest would decline under all alternatives.

Sediment yield caused by grazing management activities would decrease under all alternatives and there would be no change under the No Action Alternative.

Vegetation

Under the Preferred, Production and Enhancement Alternatives range conditions would improve and total residual ground cover would decrease. The No Action Alternative would maintain range conditions. There would be significant increases in woody key species on poor and fair condition riparian areas under the Preferred and Enhancement Alternatives with increases being the greater under the Enhancement Alternative. The No Action and Production Alternatives would result in decreases in woody species in these areas.

Alterations to plant community structure and longevity would be the most significant impacts to vegetation on forestlands scheduled for timber

harvest. Acres proposed for timber harvest over the next ten years would range from 6,027 under the Enhancement Alternative to 10,090 under the Production Alternative. Except in the Enhancement Alternative, mature and old growth forest communities would be converted to early successional stage communities as slow-growing timber stands are replaced by young, fast growing stands. Changes in plant communities and habitat could alter species composition.

There are no listed threatened and endangered plants within the planning area. However, those plants under review would be protected from impacts of construction through standard operating procedures and design elements.

Wild Horses

Wild horses would remain at a maximum of 100 head within the HMA in the Preferred and No Action Alternatives. Wild horse use would be reduced or excluded on public lands, focusing horse use on National Forest lands, in the Production Alternative. The wild horse population would increase to a maximum 522 head within the existing HMA in the Enhancement Alternative. The Preferred and Production Alternatives would reduce the size of the HMA on public lands.

Wildlife

The Preferred and No Action Alternatives would maintain existing mule deer populations. The Enhancement Alternative would support an increase in deer populations while the Production Alternative would result in a decrease in deer populations. The Preferred and No Action Alternatives would maintain existing elk populations. The Production Alternative would result in a moderate decrease in elk population, while the Enhancement Alternative would result in a high increase in elk population. None of the alternatives would significantly effect other upland species. Wetland species populations would increase under the Preferred and Enhancement Alternatives, but would be adversely affected under the Production Alternative and would be maintained under the No Action Alternative. Riparian species populations would increase under the Enhancement Alternative and to a lesser degree under the Preferred Alternative. The No Action Alternative would maintain those riparian species populations while the Production Alternative would result in moderate decrease in populations.

Overall game fish populations would increase under all alternatives. Under the Preferred, Production and No Action Alternatives, this would be due to instream fish habitat improvements and expansion of steelhead and flat water habitat. The

largest increases would be realized under the Enhancement Alternative as a result of restrictive grazing management in riparian zones.

In the long term, both income and employment would decrease in the local area under all alternatives.

Recreation

Net recreation use would increase as projected under all alternatives. Motorized use would continue to occur randomly throughout most of the resource area. Use would continue to be relatively light in most areas, with heavier use occurring in specific places close to urban areas such as John Day and Canyon City. Other recreational activities would increase at the present rate. Visitor use reductions would tend to balance increases in visitor use in activities beneficially impacted. Areawide projected use for public lands in the planning area would show approximately 22 percent increase over existing levels for a total of about 44,000 visitor days on public lands by 1997 under all alternatives.

Visual Resources

Certain portions of the planning area may experience slight short term degradation of visual quality under all alternatives. Project specific design features, as well as VRM program procedures and constraints, would minimize landform and vegetative contrast. In the long term, visual quality would improve as programs are implemented.

Cultural Resources

Appropriate measures would be taken to identify and protect cultural sites prior to ground-disturbing activities. No impacts would occur to known cultural sites of significance.

Mineral Resources

Mineral extraction would result in an irreversible or irretrievable loss of mineral resources from their natural place in the environment. The impacts would tend to occur in small, localized areas within the planning area and the loss of mineral resources through sound exploration, extraction and reclamation activities is considered to be a beneficial impact rather than adverse impact.

Economics

In the short term, under the Preferred Alternative, local income would decrease, but local employment would be unchanged. Under the Production Alternative, income would increase, but employment would be unchanged. Both income and employment would decrease under the Enhancement and No Action Alternatives.

Comparison of Impacts

This section compares in tabular form (Table 2) the impacts of each alternative. While impacts are described in detail in Chapter 4, Table 2 is presented to assist decisionmakers and reviewers by summarizing the impacts of each alternative.

Table 2 Comparison of Alternatives: Environmental Consequences

Resource	Unit of Measure	Existing Situation	Alternatives			
			A Preferred	B Production	C Enhancement	D No Action
Loss in Soil Productivity						
Timber Harvest ¹			+L	+L	+M	+L
Livestock Grazing ²			+L	+L	+L	NC
Water (Sediment Yield)						
Timber Harvest ¹			+L	+L	+M	+L
Livestock Grazing ²			+L	+L	+L	NC
Vegetation						
Riparian Condition ²			+L	+L	+M	NC
Range Condition ³			+L	+L	+L	NC
Forage Production ³	(1000 AUMs)	8.2	8.6	10.3	3.9	8.2
Disturbance from range improvements ⁴	(acres)	0	41	41	18	5
Timber Harvest Level ⁵	(MMbf)	3.4	2.17	2.21	1.32	2.20
Wild Horses						
Herd size	(no.)	100	100	100	522	100
Size of MCHMA	(1000 acres)	143.1	90.9	90.9	143.1	143.1
Mule Deer			NC	-L	+L	NC
Elk			NC	-M	+H	NC
Other Upland Species			NC	NC	NC	NC
Wetland Species			+L	-M	+H	NC
Riparian Species			+L	-M	+H	NC
Fish Populations ⁶			+M	+L	+H	+M
Economic Conditions:						
Local personal income	(\$1000)	69,236.0	-48.5	-19.6	-282.0	-21.4
Local employment	(jobs)	3,429	-2	-1	-11	-2

+ = beneficial, - = adverse, NC = no change
 L = low, M = medium, H = high

¹ Major impacts are assumed to be proportional to the amount of timber harvest. (Table 2-1 and 2-2).

² I category allotments (Table 4-2).

³ From Table 4-1.

⁴ Permanent disturbance (Table 4-3).

⁵ From Table 2-1.

⁶ Resident rainbow trout and steelhead.

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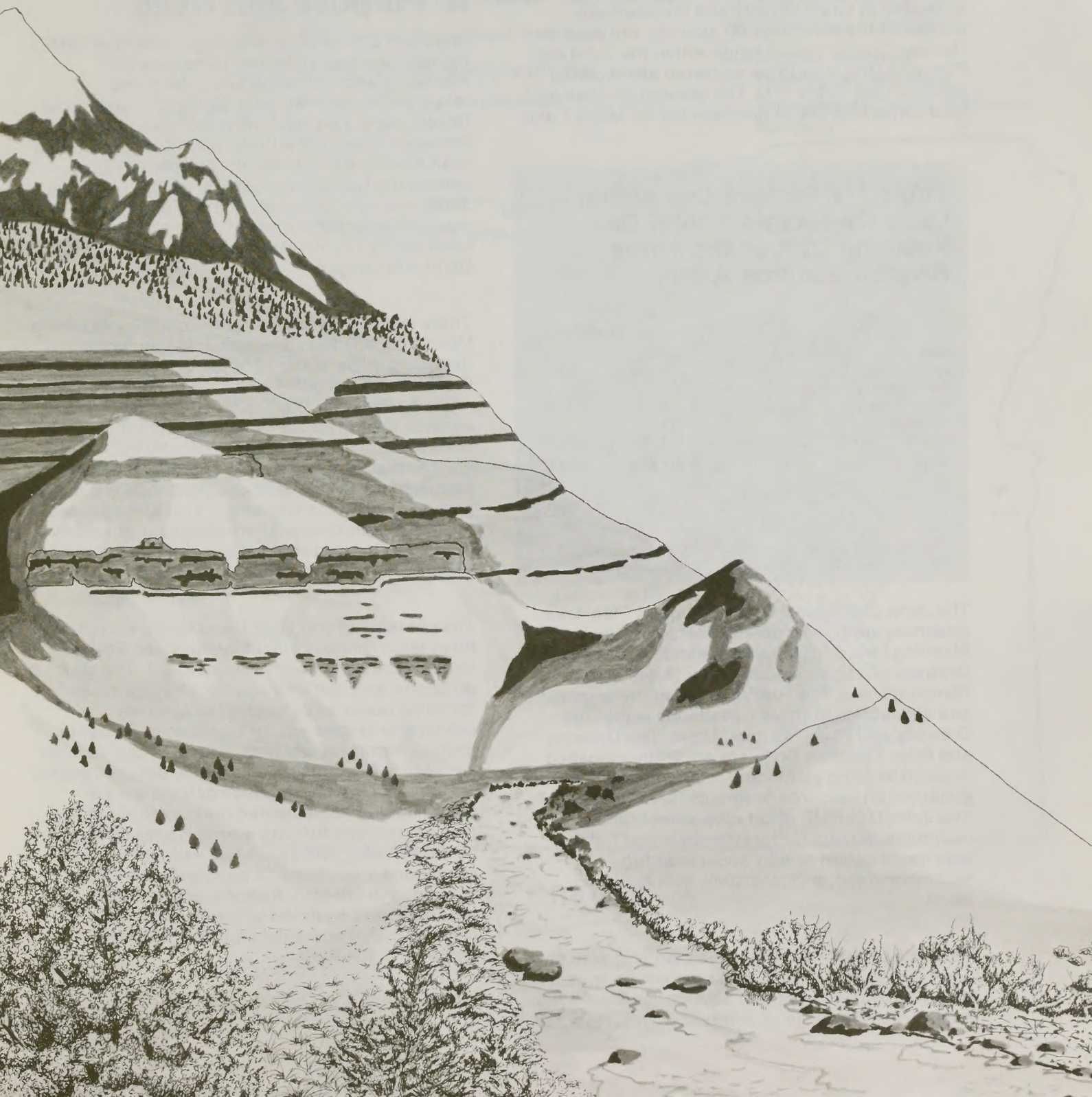
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Chapter 1

Purpose and Need



Introduction and General Location

The Burns District Office is located in Burns, Oregon. The Burns District encompasses 3.5 million acres of public lands, primarily in Harney and Grant Counties, and is divided into two resource areas: Three Rivers and Andrews. The Three Rivers Resource Area, containing 1.9 million acres, is divided into three planning units: Drewsey, Riley and John Day with 678,469 acres, 1,081,140 acres and 182,120 acres of public land, respectively. Most of the John Day Planning Unit is located in Grant County and the southern portion of the planning unit extends into northern Harney County. Public lands within the John Day Planning Unit tend to be scattered and isolated parcels. (See Table 1-1). The general location and land ownership status are depicted on Maps 1 and 2.

Table 1-1 Surface Ownership - Land Ownership - John Day Planning Unit of the Three Rivers Resource Area

	Acres	% of Total
Federal (BLM Administered*)	182,120	6.1
Federal (USFS Administered)	1,671,035	55.5
Federal (Park Service Administered)	6,300	.2
State	27,447	.9
Private	1,120,993	37.3
Total	3,007,895	100.0

*The Bureau administers an additional 178,000 acres subsurface ownership which does not include U.S. Forest Service lands.

The John Day Resource Management Plan Area (planning area) incorporates the John Day Planning Unit and those forestlands located in the Drewsey (4,143 acres) and Riley (4,442 acres) Planning Units. The RMP/EIS will address impacts and allocations of those forestlands within the Drewsey and Riley Planning Units. The Drewsey and Riley Planning Units are presently managed through existing planning documents that provide guidance on resource programs (see Chapter 5). The John Day RMP effort may accept those recommendations for forestlands either fully or with modification or may supersede those recommendations inconsistent with the RMP effort.

All of the forestlands within the planning area have been segregated into 15 management units (see Map 10). Management unit boundaries separate areas which, because of different issues, resource

values, and/or management opportunities or constraints, require different management guidance. The boundaries are not absolutely fixed, and may be adjusted in the future on the basis of additional information gained during the formulation of activity plans. No other resource program has made such a delineation and generally all resource programs, except forestry, will infer management direction and resource allocations for the entire planning area except where specified.

A. Purpose and Need

The John Day Resource Management Plan (RMP) provides a comprehensive framework for managing and allocating public land and resources in the RMP area during the next ten to fifteen years. This document includes both a Proposed Action (the Preferred Alternative) and a draft Environmental Impact Statement (EIS) addressing future management of 182,120 surface acres, and approximately 178,000 acres of reserved federal mineral estate, that are administered by the BLM through the Burns District in Oregon.

There is also a need within the John Day Planning Unit to consolidate, revise and update the decisions made in the 1974 Management Framework Plan (MFP). This new planning effort replaces the John Day Planning Unit MFP and amends the Forest Resources portion of the Drewsey and Riley Planning Units MFPs. An environmental analysis of the potential impacts associated with new land use proposals is a major portion of this planning effort. This EIS assesses the impacts of several alternative land use plans developed to meet existing and anticipated public and private needs or resource demands.

The contents of this RMP focus upon resolution of three main issues; Forest Management, Forage Use and Land Ownership Adjustment. The plan proposes land use allocations or objectives and, for some resource programs, establishes production targets and/or restrictions on use to protect important resource values. This plan does not describe or analyze all specific actions needed for full implementation. Such actions will be identified and implemented during the life of the plan as time and funding permit. These actions will be based upon, and consistent with, the various allocations, objectives, targets, and restrictions contained in the plan. Specific actions will be described and analyzed in site-specific activity plans and environmental analyses following approval of the RMP.










MAP 1

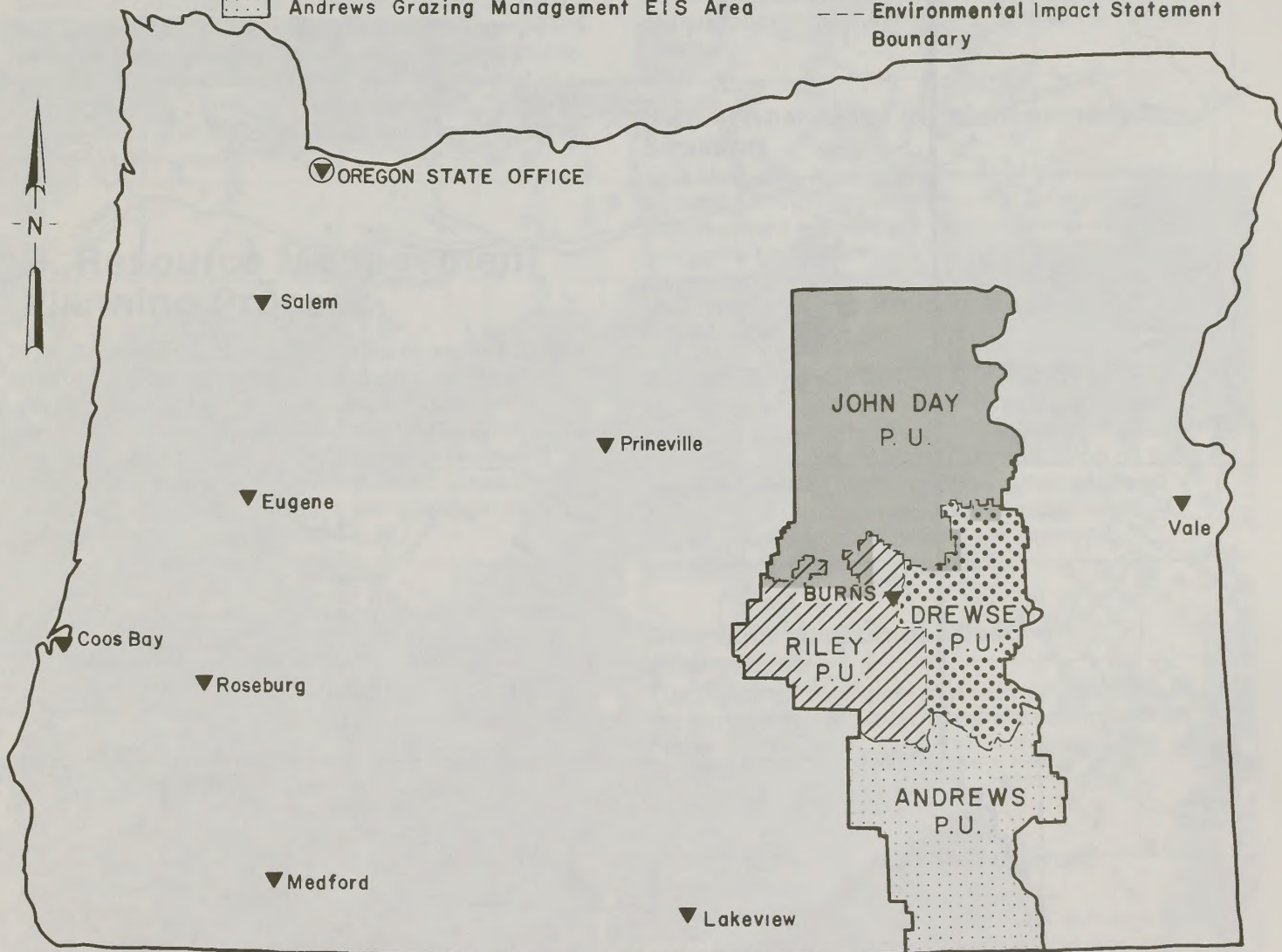
GENERAL LOCATION MAP

Burns District

Environmental Impact Statement Areas

Legend

- | | |
|--|---|
|  John Day Resource Management Plan / EIS Area |  BLM State Office |
|  Riley Grazing Management EIS Area |  BLM District Office |
|  Drewsey Grazing Management EIS Area |  District Boundary |
|  Andrews Grazing Management EIS Area |  Planning Unit Boundary |
| |  Environmental Impact Statement Boundary |

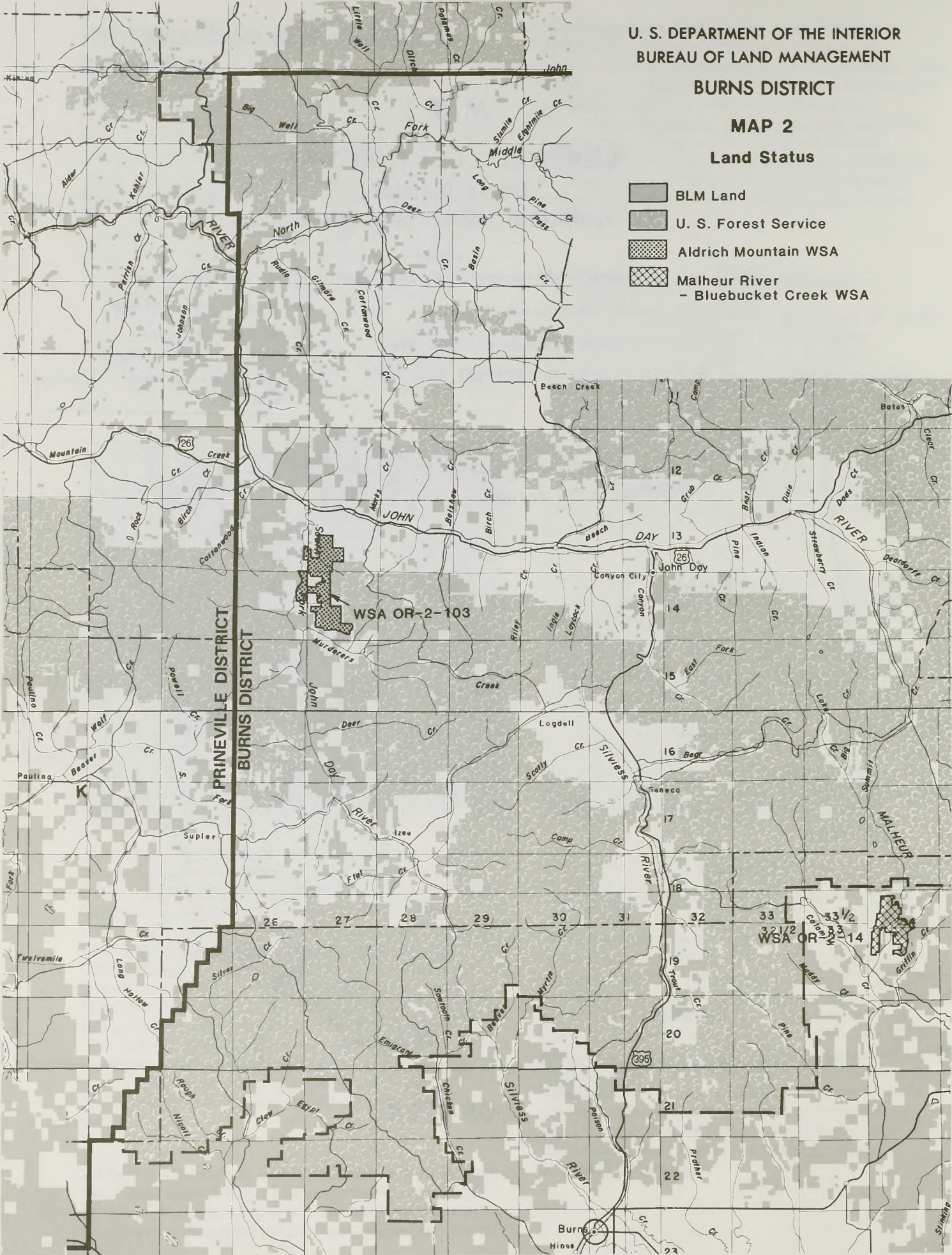


OREGON

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
BURNS DISTRICT

MAP 2
Land Status

- BLM Land
- U. S. Forest Service
- Aldrich Mountain WSA
- Malheur River - Bluebucket Creek WSA



The Bureau's principal authority to manage public lands is found in the Taylor Grazing Act of 1934, the Federal Land Policy and Management Act of 1976 (FLPMA) and the Public Rangelands Improvement Act of 1978. Through these authorities, BLM is responsible for managing resources on public lands in a manner that maintains or improves renewable resources and provides for orderly development or protection of non-renewable resources.

This EIS is written in compliance with the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality regulations and in specific response to litigation in the Natural Resources Defense Council et al. versus Rogers C. B. Morton et al. 1973 (U. S. District Court for the District of Columbia, ref. Case No. 1983-73). That suit alleged that the Bureau of Land Management's programmatic grazing EIS did not comply with the National Environmental Policy Act. As a result of the settlement of this suit, BLM agreed to prepare site specific grazing EISs. The John Day RMP/EIS will meet this requirement.

B. Resource Management Planning Process

The planning process is designed to enable BLM to accommodate the uses the public wants to make of public lands while complying with the laws and policies established by the Congress and the executive branch of the federal government. The RMP process includes nine basic steps and emphasizes the role of public participation at several key stages (see Table 1-2).

Table 1-2 Resource Management Planning Process

1. Identification of Issues*
2. Development of Planning Criteria*
3. Inventory Data and Information Collection
4. Analysis of the Management Situation
5. Formulation of Alternatives (including the Preferred Alternative)
6. Estimation of Effects
7. Selection of a Preferred Alternative*
 - a. Draft RMP/EIS (we are here)
 - b. Final RMP/EIS
8. Selection of the Resource Management Plan
9. Monitoring and Evaluation

*Steps requiring public participation.

Step 1. Identification of Issues

This step is intended to identify resource management problems or conflicts that can be resolved through the planning process.

Step 2. Development of Planning Criteria

During this step preliminary decisions are made regarding the kinds of information needed to clarify the issues, the kinds of alternatives to be developed, and the factors to be considered in evaluating alternatives and selecting a preferred resource management plan.

Step 3. Inventory Data and Information Collection

This step involves the collection of various kinds of issue-related resource, environmental, economic, or institutional data needed for completion of the process.

Step 4. Analysis of the Management Situation

This step calls for an assessment of the current situation. It includes a description of current BLM management guidance, a discussion of existing problems and opportunities for solving them, and a consolidation of existing data that is needed to analyze and resolve the identified issues.

Step 5. Formulation of Alternatives

During this step several complete, reasonable resource management alternatives are prepared, including one for no action (continuation of present levels or systems of resource use) and several that strive to resolve the issues while placing emphasis either on environmental protection or resource production.

Step 6. Estimation of Effects of Alternatives

The physical, biological and economic effects of implementing each alternative are estimated in order to allow for a comparative evaluation of impacts.

Step 7. Selection of the Preferred Alternative

Based on the information generated during Step 6, the District Manager identifies a preferred alternative. The draft RMP/EIS document is then prepared and distributed for public review.

Step 8. Selection of the Resource Management Plan

Based on the evaluation of public comments, the District Manager will select and recommend to the State Director a proposed resource management

plan and final EIS. The State Director will review and publish the plan and file the EIS with the Environmental Protection Agency. A final decision will be made after a review by the Governor of Oregon for inconsistencies with State or local plans, programs or policies and a thirty-day protest period on the proposed plan. A protest may raise only those issues which were submitted for the record during the planning process.

Step 9. Monitoring and Evaluation

This step involves the collection and analysis of long-term resource condition and trend data to determine the effectiveness of the plan in resolving the identified issues, and to assure that implementation of the plan is achieving the desired results. Monitoring continues from the time the RMP is adopted until changing conditions require a revision of the whole plan or any portion of it.

Public Participation

The planning process entails public involvement at various stages of development. To date, the John Day planning process has had three public comment periods; the first involved issue identification and planning criteria in June-July, 1981, the second for criteria for the formulation of alternatives in December 1982-January 1983 and the third for general scoping and alternative selection in October-November, 1983. The RMP Public Participation Plan and public comments received to date may be reviewed at the Burns District Office.

C. Issues

The BLM planning regulations generally equate land use planning with problem solving, or, in other words, with issue resolution. An issue may be defined as an opportunity, conflict, or problem regarding the use or management of public lands and resources. All issues must be capable of resolution through land use planning. Obviously not all issues are capable of resolution through land use planning, but may instead require changes in policy, budgets, or legislation.

As a practical matter, issue-driven planning means that only those aspects of current management direction that are felt to be at issue are examined through the formulation and evaluation of alternatives. Alternatives are not developed for those aspects of current management direction that are felt to be satisfactory during the scoping of issues.

A number of specific issues were identified in public comments at scoping meetings, responses to brochure mailings and input from a number of

groups and governmental organizations. The Burns District staff also identified a number of issues. The following discussion presents a brief overview of the issues analyzed in Chapter 4 — Environmental Consequences.

Issue 1: Forest Management

Special attention is needed to identify portions of the John Day RMP Area that are suitable for sustained yield production of forest products, and to assure that other important resources uses and values are adequately protected. Resource management considerations include deer, bighorn sheep, and elk habitat; sensitive recreation values and aesthetics; sensitive watershed; landownership pattern; and important timber values. Needed decisions include:

What is the appropriate level of forest product sales that can be sustained from accessible and manageable forestland?

What practices and which areas should be identified to mitigate forest management activities to minimize conflicts or impacts on anadromous fish, water quality and important wildlife habitat?

Issue 2: Forage Use

Grazing Management

Management changes appear to be needed in some livestock allotments in order to reduce conflicts between livestock grazing and other important resource uses and values. Such conflicts normally involve mule deer habitat, riparian areas, and sensitive watersheds. Riparian habitat is considered especially important because of its relationship to watershed protection, water quality, fisheries habitat, and terrestrial wildlife habitat diversity. Inventory data indicates that 27 percent of the surveyed area is in early seral successional stage and provides poor watershed cover, excessive runoff and low forage production for both livestock and wildlife. Some areas within the planning unit are covered with dense sagebrush and juniper. Improvement in range condition will be very slow without some reduction in brush and juniper cover. Poor livestock distribution is evident on many allotments and results in heavy use of favored areas and minimal use elsewhere. Needed decisions include:

What is the appropriate level of forage use by livestock?

What management practices or range improvements are required and appropriate to

correct past problems, enhance or increase existing resource uses and/or meet current or future grazing demands, while minimizing conflicts or impacts on anadromous fish, riparian zones, water quality and important wildlife habitat?

Wildlife and Fish Management

Public lands within the RMP Area provide key habitat for variety of wildlife species and this RMP identifies these crucial habitat areas. Livestock grazing management and range improvements may impact wildlife and fish habitat. Forest management and harvest techniques could impact wildlife and fish. Needed decisions include:

What is the appropriate level of competitive forage use to be made available for wildlife?

What management practices are required and appropriate to correct past problems, enhance or increase existing uses and/or meet current or future demands while minimizing conflicts or impacts on anadromous fish, riparian zones, water quality and important wildlife habitat?

Wild Horse Management

The Bureau is concerned about the manageability of the Murderer's Creek wild horse herd. Public land comprises 24 percent of the Herd Management Area. Maintenance of the present management population level is a primary concern. Needed decisions include:

What is the appropriate level of forage use by wild horses?

What would be the appropriate areas on public land to manage for the Murderer's Creek wild horse herd?

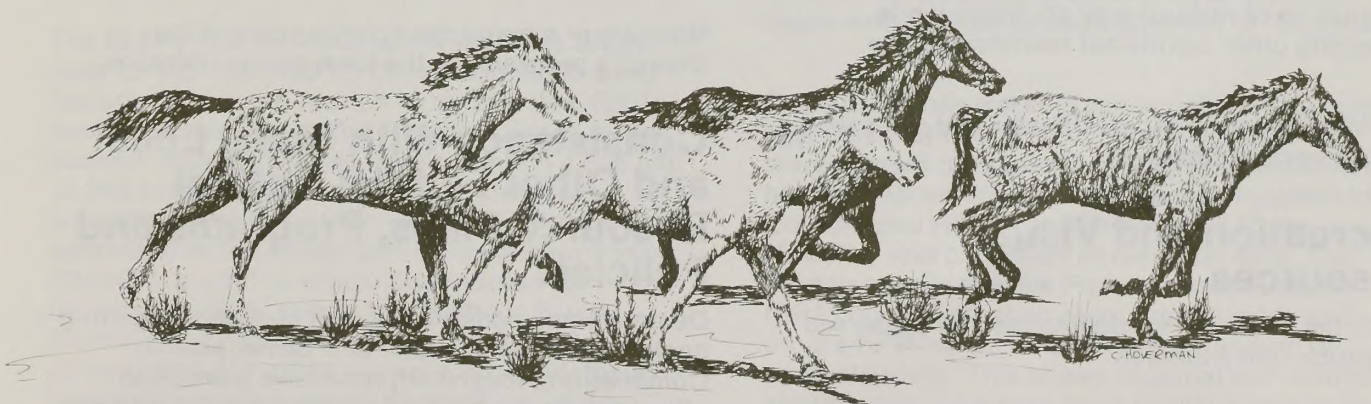
Issue 3: Land Ownership Adjustment

Special attention is needed to identify those portions of the John Day Planning Area where land ownership adjustments are needed to achieve more efficient management and utilization of public resources. Adjustments include exchanges, sales and transfers. Principal considerations include public values, resource values, current use, location, proximity to land managed by other agencies, manageability, and compatibility with adjacent land uses. Needed decisions include:

Which parcels should be sold to minimize BLM administrative costs, allow development, serve local needs or make lands available for better uses?

D. Planning Criteria For Evaluation of Alternatives

Planning criteria are measures for evaluating alternatives and selecting, or developing, a composite preferred land use alternative. The Preferred Alternative was developed to meet



national guidance and considers the following decision criteria in a cost effective manner.

Grazing Management

Meets the requirements of the Federal Land Policy and Management Act (FLPMA), Public Rangelands Improvement Act, Taylor Grazing Act and the long-term objective of stabilizing the livestock industry and producing a sustained level of livestock forage to meet regional and national needs.

Wildlife and Fish Habitat Management

Protects, improves or develops fish spawning, rearing and migration habitat.

Protects important wildlife habitat offering food and shelter during all seasons of the year.

Forest Management

Establishes a sustainable allowable harvest level and proposed timber sale level which assists in meeting local and regional needs, while protecting other resource values through set asides or appropriate restrictions on management, harvest and operational practices.

Minerals

Allows exploration and development of mineral and energy resources while protecting other significant resource values.

Lands and Realty

Allows adequate land allocations for communication sites, access development and designation of right-of-way corridors while protecting other significant resource values.

Provides land exchanges, transfer and sales which best serve public interests.

Recreation and Visual Resources

Meets the demands for developed and dispersed recreation opportunities.

Provides for maintaining the visual quality of the landscape in areas of high sensitivity.

Cultural and Botanical Resources

Protects or enhances habitat of threatened, endangered or sensitive plant species.

Provides for scientific and educational study opportunities.

Protects cultural resources in accordance with applicable laws and regulations.

Wild Horses

Protects wild horses in accordance with the Wild Free-Roaming Horse and Burro Act (PL 92-195).

Soils

Maximizes onsite water infiltration, to minimize erosion, thus maximizing vegetative production and minimizing the erosive force of flowing water.

Water

Contributes to the improvement or maintenance of water of sufficient quality and quantity for the beneficial uses in streams. Although there is not a high potential for increasing water yield, management actions can affect timing of the yield, particularly with regard to improving low flow through improved riparian conditions.

Socioeconomic Conditions

Maintains or expands the total level of local employment and personal earnings which are dependent on raw materials, recreation and other use opportunities available on lands administered by the District.

Maintain or expand the contributions of the District's programs to the local public revenues.

Consistency With State, Local and Other Federal Natural Resource Plans, Programs and Policies.

Demonstrates consistency with statewide planning goals (Land Conservation and Development Commission), local comprehensive plans, and officially approved local or tribal resource related plans, programs and policies.

Demonstrates consistency with other federal agencies' officially approved resource related

plans, programs and policies. Provides coordinated approaches to regional issues and projects of proposals crossing administrative lines.

E. BLM Planning and Resource Management Interrelationships

Interagency coordination between the Bureau and other Federal agencies, State and local governments and Indian tribes is required under Bureau planning regulations (43 CFR, Part 1610.3), and by several cooperative agreements or memoranda of understanding. The following discussion summarizes these relationships.

Federal Agencies

Portions of four national forests administered by the U.S. Forest Service (USFS) fall within the RMP area: Malheur, Ochoco, Wallowa-Whitman and Umatilla. It is important that both agencies strive for similar resource management direction on adjoining BLM and Forest Service lands and coordination of livestock use where warranted. Many of the livestock operators presently using public land also graze livestock on Forest Service lands, typically during the summer.

Preliminary discussions on a "Memorandum of Understanding" have been initiated between the Bureau and Malheur National Forest on interchange of management for federal lands. Cooperative sale of timber and coordination of harvesting has been done in the past and is expected to continue. The USFS is the lead agency on the Murderer's Creek Herd Management Area, but the Bureau cooperates on field monitoring and is the lead agency for the wild horse adoption program.

The BLM's Aldrich Mountain Wilderness Study Area (2-103, See Map 2), containing 9,395 acres lies adjacent to the Aldrich Mountain (No. 6233) and Dry Cabin (No. 6236) Roadless Areas in the Malheur National Forest, which contain 4,826 and 13,269 acres, respectively. The wilderness suitability of BLM's Aldrich Mountain WSA will be addressed in the Forest Service's Malheur Forest Plan/EIS, a draft of which is scheduled for issuance in 1985. The BLM's Malheur River-Bluebucket Creek WSA (2-14, See Map 2), containing 5,560 acres lies adjacent to Malheur National Forest where the Middle Fork of the Malheur River leaves the national forest and contains the lower drainage of Bluebucket Creek. The wilderness suitability of BLM's Malheur River-Bluebucket Creek WSA will be addressed in the draft of BLM's Statewide Wilderness EIS scheduled to be released in early 1985. Wilderness

Study Areas will continue to be managed in compliance with the Interim Management Policy for such areas until they are reviewed and acted upon by Congress.

The BLM, USFS, ODF&W, and Confederated Tribes of the Umatilla Indian Reservation have developed a coordinated plan to improve aquatic habitat in the John Day Watershed. Additionally, the BLM, USFS, and ODF&W have developed a coordinated plan to improve aquatic habitat in the Malheur River.

The National Park Service (NPS) administers the Nationwide Rivers Inventory, as provided under the National Wild and Scenic Rivers Act of 1968. Present efforts are directed toward inventory and evaluation to determine which free-flowing rivers and river segments are suitable for possible designation as components of the National Wild and Scenic Rivers System (e.g., North Fork of the John Day River). BLM consultation with NPS is required if proposed management actions could alter a river's ability to meet established Wild and Scenic Rivers Act eligibility and/or classification criteria.

The NPS administers the John Day Fossil Beds National Monument adjacent to some tracts of public land; common concerns include future demands and resource management as well as general field operations.

The U.S. Fish and Wildlife Service administers the Endangered Species Act of 1973 (as amended). Accordingly, BLM consults with that agency when it is determined that a threatened or endangered species or its critical habitat may be affected. The purpose of consultation is to obtain a formal biological opinion on the appropriate course of action. The outcome of such consultation may mean modification or abandonment of the action.

The Bureau has working relationships with many agencies that deal with common resource management or resource concerns. The Bureau has worked with the SCS in the development of Coordinated Resource Management Plans (CRMPs) and collection of resource data. The Bureau and Bonneville Power Administration (BPA) coordinate their resource management programs through a master memorandum of understanding. This allows regional and district coordination where we have similar interests in water resources and major utility corridors. The Bureau and BPA are presently involved in stabilization and improvement of riparian zones and aquatic habitat through grants provided by BPA. BPA also assists BLM in the identification and evaluation of regional utility corridor options.

The Federal Energy Regulatory Commission has issued a preliminary application for a proposal to install a run-of-river hydroelectric project utilizing the Izee Falls on the South Fork of the John Day River. A project specific environmental analysis would be required if a detailed permit request is made to the Bureau.

State and Local Governments

The BLM and Oregon Department of Fish and Wildlife (ODF&W) work closely on site specific activities. The Bureau and ODF&W have common interests in the Murderer's Creek Wildlife Management Area.

The USFS is also a cooperator in the Murderer's Creek CRMP; however, the BLM and ODF&W license and supervise livestock grazing on the same allotment due to their intermingled ownership. Grazing use, wild horse use, vegetation monitoring and evaluation, wildlife habitat improvement and maintenance, and range and wildlife improvements installation are the primary actions coordinated between the two agencies.

The Burns District contracts fire suppression activities on public land in Grant County to the Oregon Department of Forestry (ODF). Prescribed burning will be done, when needed, on a cooperative basis with adjacent landowners and ODF. Coordination with ODF and private landowners on public and private lands for forest harvest techniques and silvicultural practices is incidental.

The Oregon State Forester, by means of the Forest Practices Act of 1972, regulates timber harvest operation and supportive practices on all non-Federal lands within the planning area. Minimum standards are prescribed relating to the following forest practices:

- Timber harvest.
- Reforestation of economically suitable lands.
- Road construction and maintenance on forest land.
- Chemical applications.
- Slash disposal.
- Maintenance of streamside buffers.

Although Federal agencies are not bound by State forest practice rules, Bureau minimum standards meet or exceed State rules. The BLM or USFS, acting jointly, have entered into a Memorandum of Understanding (MOU) with the State Forester in this regard.

The BLM cooperates with the Soil and Water Conservation District due to the mutual goal to coordinate range and watershed practices and to gather and disseminate natural resource information for beneficial use on private and public lands.

Most of Grant County and the northern portion of Harney County are included in the RMP area. None of the county plans or zoning regulations place binding constraints on public land management. Under Section 202 of FLPMA and the BLM planning regulations RMPs must be consistent with officially approved or adopted resource related plans, policies and programs of other Federal agencies, State and local governments and Indian tribes so long as the plans are also consistent with the purposes, policies and programs of Federal laws and regulations.

Any potential conflicts are uncertain because neither county to date has a Comprehensive Land Use Plan which has been acknowledged by the Oregon Department of Land Conservation and Development Commission (LCDC) to be consistent with statewide planning goals. Consistency of the plan alternatives with statewide planning goals is addressed in Table 1-3.

Grant County's zoning ordinance was enacted September 1, 1971 and later revised in 1975 and 1979. Almost all of the public lands fall within the Recreation and Farm Zone, R-3, designation but a few parcels also lie within the area designated Exclusive Farm Zone, F-1.

Harney County's zoning ordinance was enacted on June 26, 1980 and later revised on December 21, 1983. This revision went into affect on February 2, 1984 with further revisions made on April 18, 1984. Almost all of the public lands, within the planning area, fall within the Forest Zone — 1 designation (with 80 acres minimum lot sizes) or the Exclusive Farm Use Zone — FU-1 (with 160 acres minimum lot sizes).

Individuals and Groups

There are 1,120,993 acres of private land within the boundaries of the RMP area. These lands constitute approximately 37 percent of the surface ownership (see Table 1-1). BLM ownership comprises approximately 6 percent, therefore, coordination is of the essence if management is to be achieved on these intermingled tracts of public lands. On allotments where the Bureau has primary ownership, AMPs normally will suffice for coordination between the Bureau and landowner. However, on allotments with multiple ownerships

or complicated resource problems development of a Coordinated Resource Management Plan (CRMP) may bring better resolution to livestock management and other resource objectives. A CRMP may involve several agencies and various landowners, e.g., SCS, ODF&W, BLM, grazing association, USFS and private landowners.

The John Day RMP Area lies within areas which were ceded to the U.S. Government by the Warm Springs Indian tribe by ratified treaty. This treaty reserved to the Indians' rights for hunting, fishing and gathering in usual and accustomed places, and grazing stock on unclaimed land.

Contemporary Native American interests in the area include the protection of Indian burial grounds and the perpetuation of certain traditional activities, particularly root gathering and fishing. Members of the Burns Paiute Band still gather roots in the vicinity of Izee and take willows along the Silvies River (Couture 1984; Toepel et al. 1979). The Umatilla Indians are concerned about maintaining salmon spawning within the North Fork of the John Day River.

Coordination and Consistency With Other BLM Plans

Those affected forested acres in Drewsey and Riley Planning Units have, until recently, been guided by two separate land use plans.

The Preferred Alternative as it relates to the Drewsey and Riley Planning Units incorporates forestry related decisions that were previously developed in the Drewsey and Riley Management Framework Plans (MFPs). The Drewsey MFP included the designation of a primitive area (within the Malheur River-Bluebucket Creek WSA, 2-14) and as a result affected 131 acres of forestland. The Riley MFP included the Silver Creek ACEC/RNA and as a result affected 30 acres of forestland. Those two areas of forestland are prohibited from harvest in the John Day RMP Preferred Alternative.

This RMP/EIS will coordinate site specific planning and activities with adjacent districts, Vale and Prineville, when needed.

Aldrich Mountain — A Proposed Area of Critical Environmental Concern

Proposed Aldrich Mountain Area of Critical Environmental Concern (ACEC) was identified in the John Day RMP Proposed Land Use Alternatives brochure as an issue. This ACEC proposal originated from Burns District Office staff. However, evaluation showed that proposal did not meet ACEC criteria, partly because ACEC designation would not protect the values of concern.

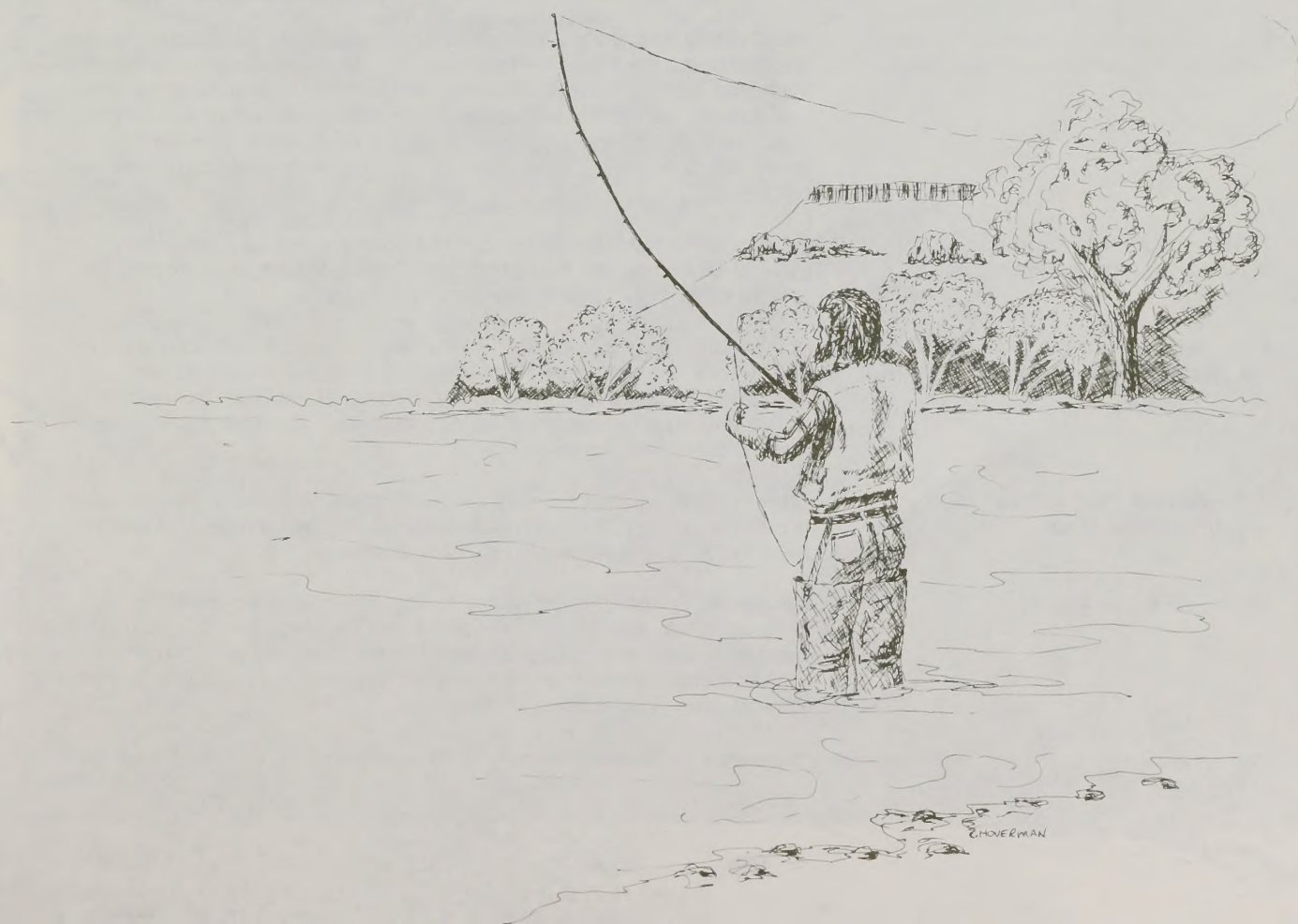


Table 1-3 Relationship of the Preferred Alternative and Alternatives to Land Conservation and Development Commission (LCDC) Goals¹

**LCDC Statewide Goal
Number and Description**

Discussion

1. To ensure citizen involvement in all phases of the planning process.

BLM's land use planning process provides for public input at various stages. Public input was specifically requested in developing the Preferred Alternative, other alternatives, issues, and planning criteria described in the EIS. Public input will continue to be utilized in the environmental analysis process and development of the final RMP.

2. To establish a land use process and policy framework as a basis for all decisions and actions.

The proposed action and other alternatives have been developed in accordance with the land use planning process authorized by the Federal Land Policy and Management Act of 1976 which provides a policy framework for all decisions and actions.

4. To conserve forestlands for forest uses.

The planning area is predominantly commercial forestland or juniper woodlands. The proposed action and all other alternatives provide for retention of inventoried forestlands for forest uses. The Preferred and Enhancement Alternatives would decrease forest product sales levels but enhance (increase) protection of other forest resources. The Production Alternative would increase timber production. The No Action Alternative would retain current management direction with no change in timber production.

5. To conserve open space and protect natural and scenic resources

The Bureau planning system considers natural and scenic resources in the development of the Preferred Alternative and other alternatives. Forest product sales, forest development, fencing and vegetation manipulation projects in the Preferred Alternative and other alternatives would impact open space as well as natural and scenic resources. Adverse impacts to visual resources, cultural resources, wildlife habitat, water resources and unique natural areas are greatest under the Production Alternative and least under the Enhancement Alternative.

6. To maintain and improve the quality of the air, water and land resources.

The Federal and State minimum water quality standards would be met and water quality would be maintained and/or improved under the Preferred Alternative and all alternatives. Prescribed burning for brush and juniper control in the Preferred Alternative and other alternatives would temporarily affect air quality, primarily at upper atmospheric levels. All alternatives would comply with the statewide smoke management plan.

7. To protect life and property from natural disasters and hazards.

All alternatives include identification of potential hazard areas and general BLM program and operational measures for protection of life and property from natural disasters and hazards.

8. To satisfy the recreational needs of the citizens of the State and visitors.

The BLM actively coordinates its outdoor recreation and land use planning efforts with those of other agencies to establish integrated management objectives on a regional basis. Under the Preferred Alternative and all other alternatives, opportunities would be provided to meet recreational needs.

9. To diversify and improve the economy of the State.

The Preferred Alternative and the Production Alternative would induce economic gains in the long term due to increased forage production, resulting in improved local and State economy.

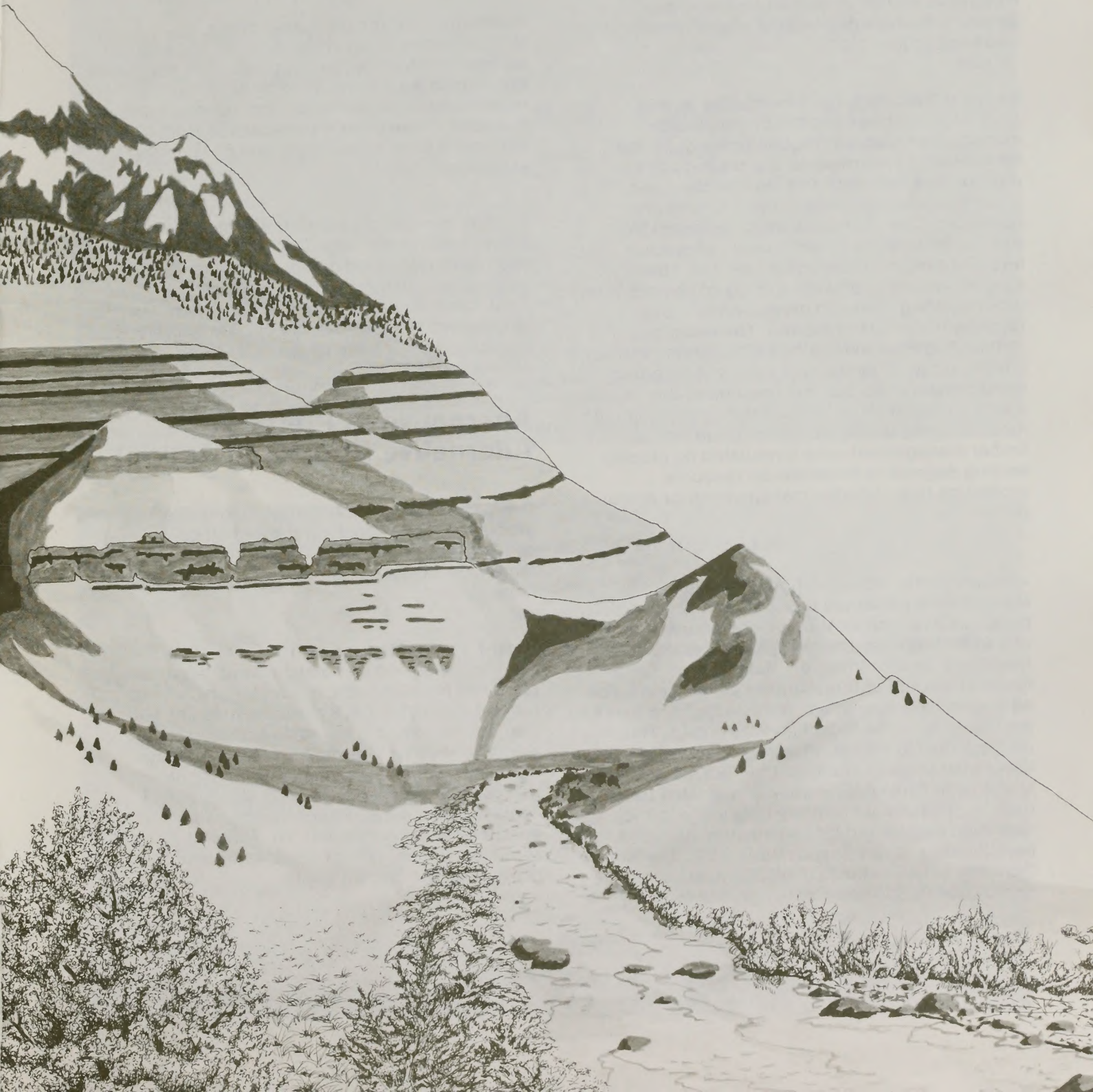
13. To conserve energy.

Conservation and efficient use of energy sources are objectives in all BLM activities. Use of cull logs and slash for chips and firewood is encouraged. Sale and harvest of minor forest products (i.e., posts, poles, firewood) from woodlands and non-commercial forest areas is permitted in most areas under all alternatives.

¹ LCDC statewide goals 3, 10, and 14 are not generally applicable to the Preferred Alternative nor the other alternatives. Goals 15-19 are not applicable to Grant and Harney Counties.

Chapter 2

Alternatives and the Preferred Plan



Alternatives Considered In Detail

Introduction

Four alternatives are considered in detail in this chapter. Three of them, Production of Commodities, Enhancement of Natural Resources and No Action, were developed to explore a reasonable range of issue resolution scenarios as required by CEQ and BLM planning regulations. A fourth alternative, the Preferred alternative, or proposed RMP, incorporates portions of the Production of Commodities, Enhancement of Resources and No Action alternatives, and generally represents a middle ground approach to issue resolution.

Both the National Environmental Policy Act (NEPA) regulations and the BLM resource management planning regulations require the formulation of alternatives. Each alternative represents a complete and reasonable plan to guide future management of public land and resources. One alternative must represent No Action. This means a continuation of present levels or systems of resource use. The other alternatives are to provide a range of choices from those favoring resource protection to those favoring resource production. The basic goal in formulating RMP alternatives is to identify various combinations of public land uses and resource management practices that respond to the planning issues. Alternatives for the resolution of most planning issues including, for example, timber management were formulated by placing varying degrees of emphasis on resource protection (e.g., riparian management) or resource production.

Alternatives for the resolution of Forest Management issues are based upon the same data base, however, the existing planned harvest level of 3.4 MMbf is based upon 48,818 acres of forestland. Recent inventory data has redefined the total amount of forestland as 44,465 acres. For all alternatives, allocations or restrictions in acres are based upon the recent inventory data. This portrays the No Action Alternative harvest level lower than presently occurs. In FY 85 the decadal sustainable harvest level will be calculated based upon supplemental inventory data made in the 1984 field season and management restrictions based upon and developed in this RMP. The Non-Operable set aside lands in all alternatives include approximately 530 acres of old growth forest.

Alternatives for the use of forage issues are based on vegetative inventory data, analysis of grazing systems in the RMP Area and professional judgement. While these data are adequate for purposes of planning and analysis, they are insufficient for determination of accurate carrying capacity data and must be supported by results of monitoring studies prior to proposing adjustments in livestock use. Consequently, these adjustments in livestock use authorizations within 1 category allotments distributed through the alternatives may actually be more or less than projected livestock use levels (see Table 2-3).

Alternatives for the resolution of the landownership adjustment issue do not lend themselves to protection or production emphases, but instead were formulated by applying the interdisciplinary criteria for land retention and disposal. These criteria were derived from applicable laws, regulations, and BLM policy statements.

In order to highlight the BLM's Preferred alternatives for the John Day RMP, it is the first alternative discussed in this chapter, and subsequent chapters. It is followed by the Production, Enhancement and No Action alternatives in that order. No priority or preference is implied by the order of the latter three alternatives.

Alternative A: Preferred Alternative (Proposed Action)

Goal: The Preferred alternative emphasizes production of livestock forage and other commodities while accommodating wildlife, recreation, visual resources, water quality and wild horses.

Issue 1: Forest Management

All woodlands and commercial forestland, not classified Non Operable, would be available for harvest except for 1,828 acres excluded as Multiple Use Set-Aside and 1,280 acres constrained by wildlife concerns. Special harvest restrictions would be applied in big game winter range and harvest exclusions in riparian areas, and bald eagle roosting areas. Forest management adjustments are summarized in Tables 2-1 and 2-2. Management intensity of woodlands would continue at the current level.

Table 2-1 Determination of Sustainable Harvest Levels¹

	Alternatives			
	A Preferred	B Production Enhancement	C No Action	D No Action
No Planned Timber Harvest (Acres)				
- Non-Commercial Forest Land	7,103	7,103	7,103	7,103
- Non-Operable	3,292	3,292	3,292	3,292
- Multiple Use Set-Aside ²	1,828	1,454	8,072	1,532
Sub-Total	12,223	11,849	18,467	11,927
Timber Production Base (Acres)				
- Full Timber Production	30,962	31,609	18,867	31,433
- Multiple Use Constrained ³	1,280	1,007	4,094	1,105
Sub-Total	32,242	32,616	22,961	32,538
Total Forest Land (Acres)	44,465	44,465	44,465	44,465
Approximate Annual Timber Sale Program (MMbf.) ⁴	2.17	2.21	1.32	2.20 ⁵

¹ Minor forest products (i.e., firewood, posts and poles) are not included.

² See table 2-2 for acreage distribution by resource value.

³ Actual acres have not been identified. Acreages shown are an indication of equivalent acres required to obtain desired resource protection.

⁴ A sustainable harvest level for all of eastern Oregon is being recalculated. Therefore, an assumption for purposes of analysis is that the annual timber sale plan program would be equal to 70 board feet per acre designated for full timber production.

⁵ This annual timber sale program level reflects current inventory information and is substantially lower than the existing harvest level of 3.40 MMbf.

Table 2-2 Set-Asides and Constraints for Multiple Use

	Alternatives			
	A Preferred	B Production Enhancement	C No Action	D No Action
Multiple Use Set-Aside				
- Fisheries/Riparian	956	713	2,043	660
- Bald Eagle	711	711	711	711
- Old Growth	0	0	5,157	0
- Recreation/Visual	131	0	131	131
- Research Natural Area	30	30	30	30
Total	1,828	1,454	8,072	1,532
Multiple Use Constrained				
- Wildlife	1,280	1,007	4,094	1,105
- Recreation/Visual	0	0	2,537	0
Total	1,280	1,007	6,631	1,105

Issue 2: Forage Use

Grazing Management — Authorized livestock use would continue at current levels (see Table 2-3). Increases or decreases in AUMs would be proposed for I category allotments where inventory or monitoring data indicates the need; range improvements and management systems on I category allotments would be implemented where the greatest potential exists for improvement of watershed, wildlife, range condition and livestock forage. Estimated range improvements are summarized in Table 2-4 (see Appendix B, Table B-1 for allotment specific proposal). Additional management systems may be implemented where potential for resource improvement and sufficient manageability exists for M and C category allotments.

Wildlife and Fish Management — To meet big game population targets, 500 AUMs of competitive forage in I category allotments would be used by big game, primarily mule deer. In allotments 4020 and 4024, 360 AUMs of forage would be used by bighorn sheep. Anadromous fisheries would be expanded and improved and resident fisheries would be improved through placement of instream structures. Livestock grazing would be managed on riparian zones in M and I Category allotments. Cold and warm water fisheries would be developed.

Wild Horse Management — Wild horse use would continue at existing levels and reduction of the HMA size would occur (see Table 2-5 and Map 3).

Table 2-3 Summary of Projected Grazing Use (AUMs) by Alternative

I Allotments		Alternatives							
		A		B		C		D	
		Preferred		Production		Enhancement		No Action	
No.	Name	Short Term	Long ¹ Term	Short Term	Long ¹ Term	Short Term	Long ¹ Term	Short Term	Long ¹ Term
4007	Windy Point	407	427	427	509	305	305	407	407
4049	Battle Creek	830	872	872	1038	622	622	830	830
4052	Big Baldy	1743	1830	1910	2179	0	0	1743	1743
4068	Sheep Gulch	292	307	307	365	219	219	292	292
4086	Rudio Mtn.	590	620	620	738	442	442	590	590
4097	Trout Creek	568	596	596	710	426	426	568	568
4098	East Cr.-Pine H.	374	393	393	468	280	280	374	374
4103	Rockpile	928	974	1011	1160	0	0	928	928
4120	Ferris Creek	280	294	294	350	210	210	280	280
4124	Smokey Creek	307	322	322	384	230	230	307	307
4151	Kinzua	1170	1229	1229	1462	878	878	1170	1170
4156	Rudio Creek	369	387	387	461	277	277	369	369
4163	Creek	51	53	53	64	38	38	51	51
4164	Corral Gulch	318	334	355	397	0	0	318	318
Total		8227	8638	8776	10285	3927	3927	8227	8227



¹Long-term livestock use levels displayed are estimates and are for analysis purposes only.

U.S. DEPARTMENT OF THE INTERIOR
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BURNS DISTRICT

MAP 3

Murderers Creek Herd
Management Area

-  Alternatives A and B
 Alternatives C and D

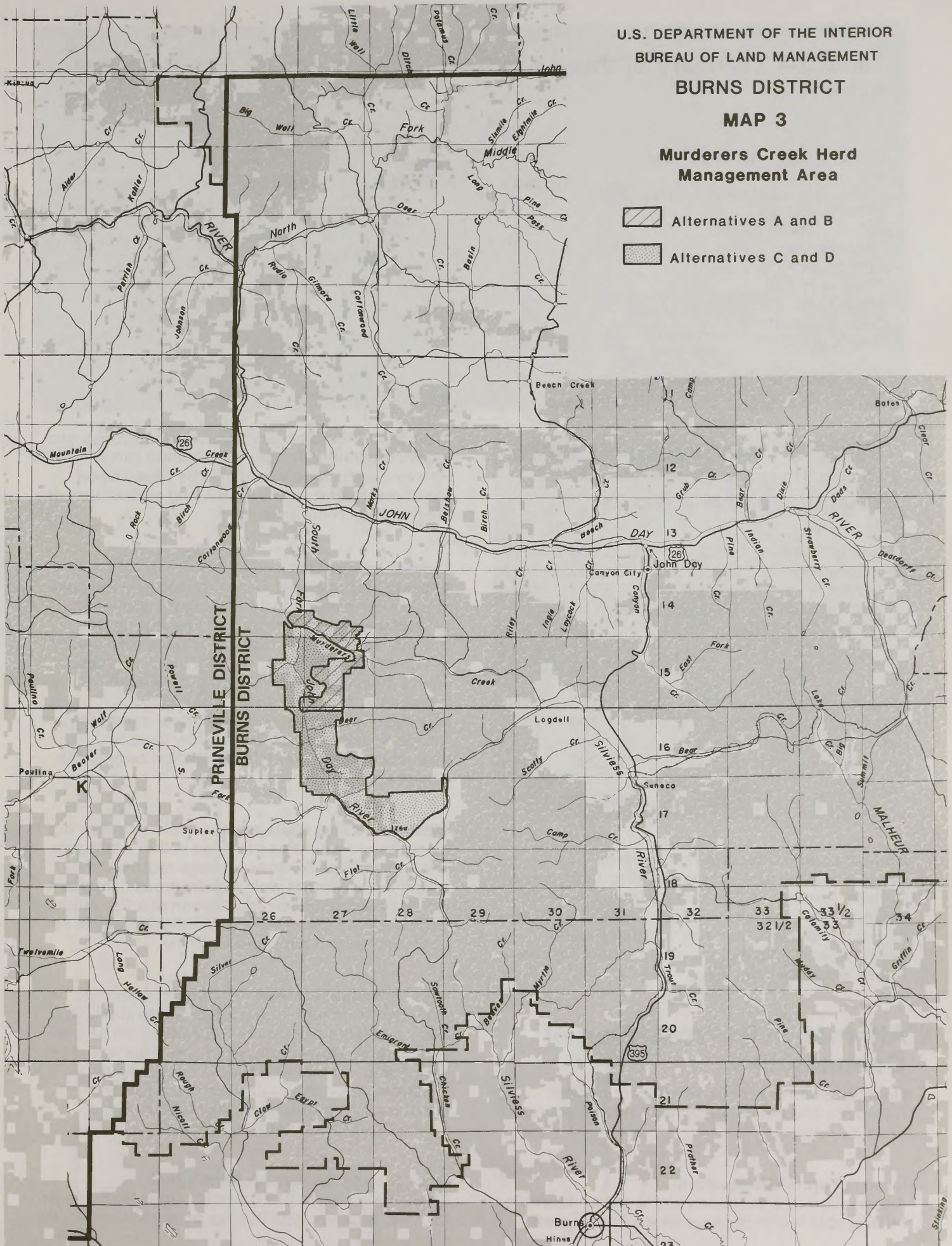


Table 2-4 Summary of Proposed Range Improvements for I Category Allotments

Improvement	Alternatives			
	A Preferred	B Production	C Enhancement	D No Action
Seeding (acres)	1905	2235	0	850
Juniper control (acres)	4390	6510	1200	1125
Fence (miles)	26.5	26.5	12.75	9.0
Springs (No.)	29	29	17	5
Pipeline (miles)	2	2	0	2
Stock Tanks (No.)	31	31	18	7
Cattleguards (No.)	0	2	0	0
Reservoirs (No.)	40	40	18	4
Initial Estimated Cost (\$000)	431	470	183	91

Table 2-5 Land Ownership Within the Murderer's Creek Herd Management Area (Acres)

Existing Situation:	USFS	73,600	51%
Enhancement and	BLM	34,200	24
No Action	ODF&W	7,900	6
Alternatives	State Land Board	40	-
	Private	27,400	19
	Total	143,140	100%
Proposed HMA:	USFS	73,600	81%
Preferred and	BLM	10,120	11
Production	ODF&W	6,160	7
Alternatives	Private	990	1
	Total	90,870	100%

Issue 3: Land Ownership Adjustments

There would be 5,240 acres of public land offered for sale. Another 16,000 acres of public land would be considered for disposal (see Table 2-6 and Map 4). Exchanges and transfers to other federal agencies would take place when natural resource values would benefit.

Alternative B: Production of Commodities

Goal: Emphasize production of commodity resources and the enhancement of local economic benefits.

Issue 1: Forest Management

All commercial forestlands and woodlands would be available for timber harvest except for areas

excluded for bald eagle roosts, riparian zones and areas constrained for big game winter range. Harvest restrictions would also be based upon forest productivity, operability, and silvicultural or regeneration requirements.

Issue 2: Forage Use

Grazing Management — Authorized livestock use would be increased in 14 I Category allotments, primarily where inventory and monitoring data indicate additional forage is available (see Tables 2-3 and 2-4). Additional management systems would be implemented where potential for resource improvement and sufficient manageability exists. Any additional competitive forage available would be used by livestock whenever present wildlife population targets are exceeded.

Wildlife and Fish Management — Competitive big game forage would be provided within I category allotments. Bighorn sheep forage requirements would be fulfilled as well. Anadromous fisheries would be expanded by installation of a fish ladder. Resident cold and warm water fisheries would be improved by reservoir development.

Wild Horse Management — Wild horses would be excluded from regular use of public land (BLM) and associated private and ODF&W lands as well (see Map 3). However, a winter use area would be established so that wild horses could utilize lowlands, if needed, during severe weather conditions. The wild horse AUMs thus made available would be used by livestock.

Issue 3: Land Ownership Adjustment


There would be 21,014 acres of public land offered for sale. Another 16,000 acres of public land would


U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

BURNS DISTRICT

MAP 4

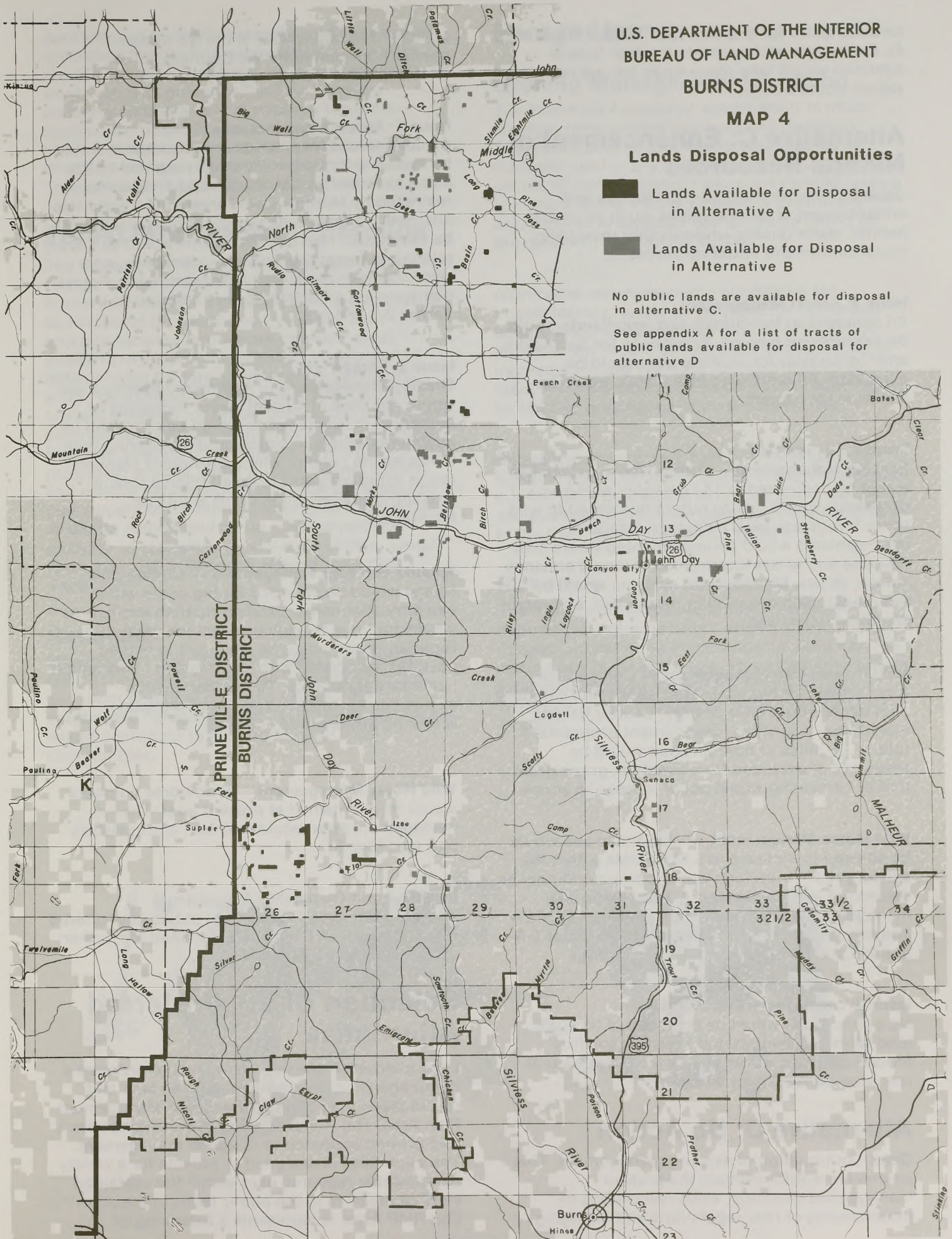
Lands Disposal Opportunities

 Lands Available for Disposal
in Alternative A

 Lands Available for Disposal
in Alternative B

No public lands are available for disposal
in alternative C.

See appendix A for a list of tracts of
public lands available for disposal for
alternative D



be considered for disposal (see Table 2-6 and Map 4). Exchanges and transfers to other federal agencies would take place when natural resource values would benefit.

Alternative C: Enhancement of Natural Resources

Goal: Emphasize maximum protection and enhancement of natural values, such as wildlife habitat, water quality, undeveloped recreation opportunities and visual resources.

Issue 1: Forest Management

All commercial forestlands and woodlands would be available for harvest. Exceptions for Set-Asides and Constraints for Multiple Use would be expanded. All remaining forestlands would be available for harvest.

Issue 2: Forage Use

Grazing Management — Authorized livestock use would be decreased in 14 I category allotments; 7 allotments would realize reductions linked to wild horse forage use level increases. Range improvements would be implemented where cost effective and where improvements would enhance natural values. Management systems would be designed to achieve wildlife, watershed, and range condition objectives.

Wildlife and Fish Management — Competitive forage needs of big game species within I category allotments would have priority. Crucial habitat would have priority in management programs. A total of 76 miles of riparian zone would be restricted or excluded from livestock grazing. No timber harvesting would occur in riparian zones.

Wild Horse Management — Wild horse use would be allowed to increase to 5,061 AUMs within the existing HMA. Livestock would correspondingly be decreased in numbers and AUMs. Wild horse management on public lands, associated ODF&W and private lands would intensify (see Tables 2-3 and 2-6 and Map 3).

Issue 3: Land Ownership Adjustment

No public lands would be disposed of through land sales. Exchanges and transfers to other federal agencies would take place when natural resource values would benefit.

Alternative D: No Action

Goal: Continuation of existing management. This alternative would maintain the present management direction, while responding to requirements of new regulations and changing

policies. This alternative is the No Action alternative required by the Council on Environmental Quality regulations.

Issue 1: Forest Management

All commercial forestlands and woodlands would be available for timber harvest except for 1,532 acres excluded by Set-Asides and 1,105 acres restricted by Multiple Use Constraints. Under this alternative a timber management plan would not be developed. Harvest restrictions would still apply relating to forest productivity, operability, and silvicultural or regeneration requirements. Forest management adjustments are summarized in Tables 2-1 and 2-2.

Issue 2: Forage Use

Grazing Management — Authorized livestock use would continue at current levels. Increases or decreases in livestock use would be proposed for allotments, where inventory and monitoring data indicates the need or where previously planned range improvements create additional forage. Existing management systems would be maintained.

Wildlife and Fish Management — Competitive forage would be provided for big game within I category allotments. Existing riparian exclosures would continue to exclude livestock grazing. Riparian zones would be managed in fenced pastures associated with streams and rivers within I category allotments. Timber harvesting exclusions for riparian zones and big game wintering areas would continue.

Wild Horse Management — Wild horse numbers would be maintained at present level. The management area would maintain at its existing size (see Map 3).

Issue 3: Land Ownership Adjustments

There would be 36,779 acres of public land offered for sale. No lands have been identified for further study (see Table 2-6 and Map 4).

Selection of the Preferred Alternative

Each alternative considered in detail represents a comprehensive plan for managing all land and resources in the John Day Resource Management Plan Area. The Preferred Alternative emphasizes a mid-ground approach to resource management. The alternative is designed to provide for a variety of renewable resource uses within the sustained yield capabilities of the public lands in the John Day RMP Area. It represents a balancing of

conflicts and tradeoffs between land uses while protecting fragile, non-renewable resources as required by law. The Preferred Alternative best meets national guidance, best satisfies the planning criteria and best resolves the three issues. Alternative A was developed as the Preferred Alternative, and the management direction for resolving each of the three issues under Alternative A is summarized below.

Forest Management Direction

The Preferred Alternative would result in moderate change from current management direction. Forest and woodland products would continue to be harvested on a sustained yield basis on appropriate sites throughout the RMP area. Intensive management including investment of federal funds for forest management activities would be focused in a few select areas with the highest potential for timber production and lowest potential for conflicts with other resource values. Standard operating procedures developed for the protection of soils, water quality, scenic values, and wildlife habitat would continue to be applied (see Appendix G). Minor amounts of forested land would be categorized as no plan harvest due primarily to protection provided for wildlife, visual resources and a Research Natural Area (See Table 2-2).

Rationale

Management direction is resulting in moderate conflicts between forest management activities and other resource uses and values. The sustainable harvest level of 21.70 MMbf per decade would contribute to the economy of local communities.

Forage Use

Grazing Management Direction

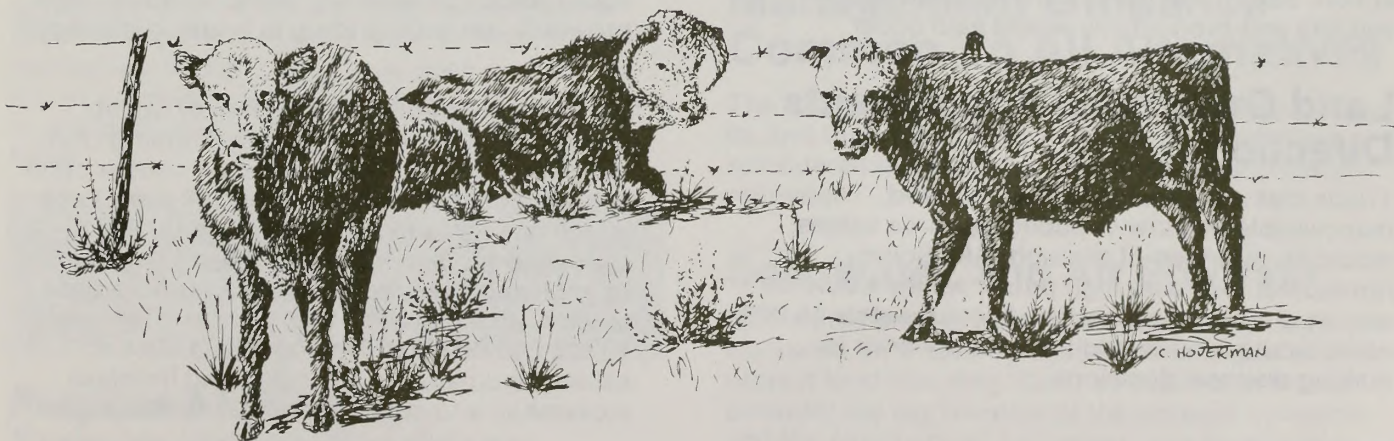
The Preferred Alternative would result in minor changes from current management direction. There would be no short-term adjustments in livestock use for any allotments. Livestock grazing on 143 M and C category allotments would remain at current levels. Future upward or downward adjustments in livestock use would be based on the results of monitoring studies.

Allotments, where resource conditions are unsatisfactory, would be targeted for corrective action. Allotments with high potential for range improvement would be managed with the goal of increasing future livestock forage primarily to resolve other resource problems in the allotments by shifting grazing use from problem areas.

Range improvements, treatments, and grazing systems would be implemented in accordance with current BLM policy, and would be designed to achieve specific multiple use objectives identified in the RMP (see Appendix E, Table E-1).

Rationale

The Preferred Alternative would provide for improvement of vegetation, wildlife habitat, and riparian habitat conditions, while causing minimal disruptions in livestock use. This alternative strikes a balance between the enhancement of natural values and the production of additional livestock forage.



Wildlife and Fish Management Direction

The Preferred Alternative would result in substantial changes from current management direction. There would be 1,280 acres foregone to protect big game habitat. An additional 1,667 acres of commercial forestland would not be available for timber harvest to protect fisheries and bald eagle habitat. Grazing management on 28.5 miles of riparian zone within I category allotments would be coordinated with permittees. Instream improvements would be made on existing fisheries and expansion of anadromous fisheries habitat would be attempted where feasible.

Rationale

The Preferred Alternative provides for improvement of upland habitat and riparian habitat. Big game thermal and hiding cover, snag habitat and other forested wildlife habitat would improve slightly. Protection of bald eagle roosting sites would be provided. Aquatic habitat and fish populations would increase due to fishery developments. Antelope would benefit from juniper/brush control and seeding.

Wild Horse Management Direction

The existing herd management area would be reduced in size on the public land, and associated ODF&W and private lands. The HMA, not inclusive of the USFS, would be 25 percent of its current size on public land, associated private and ODF&W lands. Wild horse use would continue at existing levels but would be restricted to the revised fence boundary.

Rationale

Wild horse management would be vastly improved by reduction of the herd area. Horse trespass on private lands would be alleviated by this proposed action. Better wild horse herd monitoring for viability and productivity would also occur.

Land Ownership Adjustments Direction

Tracts that are generally small, isolated, inaccessible and low in public resource values would be disposed of through sale. Some nonfederal land with high public values would be acquired through exchange. Approximately 16,000 acres would require additional study prior to making disposal decisions.

Rationale

The current land ownership pattern within the John Day RMP Area is characterized by numerous isolated parcels of BLM administered land that are

inaccessible to the public and relatively difficult for BLM to manage. The Preferred Alternative would allow land ownership adjustments to occur, and this would result in improved management efficiency, fewer conflicts between the public and private landowners, and greater public benefits through improved access opportunities and consolidation of public land in those areas retained. It would also allow for some public land to be put to more productive use in private or local government ownership.

Issues/Alternatives Eliminated From Detailed Study

The following alternatives were considered as possible methods of addressing specific issues in the John Day RMP Area, but were eliminated from detailed study due to technical, legal, and/or other constraints.

No Grazing

The elimination of livestock grazing from all public land in the planning area was considered as a possible method of resolving the forage issue. Based on interdisciplinary discussions and public review and comment during the criteria development step of the planning process, the no grazing alternative was eliminated from detailed study for the following reasons:

1. The condition of range resources including vegetation, watershed, and wildlife habitat, do not warrant considering a planning area-wide prohibition of livestock grazing.
2. Public comments received during the issue identification, criteria development and alternative selection steps indicate a general acceptance of livestock grazing on public land, provided that such grazing is properly managed.
3. The highly fragmented pattern of public landownership in the John Day Planning Unit would necessitate extensive fence construction at great public expense, if livestock were to be effectively excluded from public land. An estimated 1,250 miles of fence would be needed to implement exclusion of livestock from public lands at an estimated initial construction cost of \$2,625,000.00. Such fencing would disrupt established patterns of wildlife and livestock movement, and could also affect public access.

In summary, implementation of a no-grazing alternative is not considered to be feasible or relevant except in specific, localized situations

where livestock use is incompatible with other important management objectives. In these specific areas, the Enhancement Alternative provides for exclusion of grazing.

Differing Levels of Livestock Use in M and C Category Allotments

Livestock forage use would remain constant throughout all alternatives for the 3 Maintain (M) and 140 Custodial (C) category allotments. Available data is insufficient to warrant changing current forage use. The majority of the C category allotments are small tracts ranging from 40 — 640 acres in size and are intermingled with private lands. They are grazed in conjunction with private lands. Alternatives which would propose modest increases or decreases in stocking levels would not have a significant impact on any resources. Therefore livestock use in the M and C category allotments would remain constant at the present levels in all alternatives. Future changes in these allotments, if proposed to address subsequently identified issues, would be analyzed on site specific basis.

Jurisdictional Land Transfers to the Forest Service

This alternative was considered for BLM-administered land contiguous to national forests. It was eliminated from detailed study in this RMP because it would unnecessarily duplicate other jurisdictional transfer studies currently being conducted by both agencies. In addition, transfers to another multiple-use management agency would not normally affect land and resource uses.

Unconstrained Alternatives

No alternatives that proposed maximum area-wide production or protection of one resource at the expense of other resources were considered appropriate to analyze because such alternatives would violate the BLM's legal mandate to manage public land on a multiple-use, sustained-yield basis.

The following items were considered as potential issues within the John Day RMP Area, but were eliminated as a result of the public scoping process.

Proposed Utility or Transportation Corridors

The May, 1980 Western Regional Corridor Study prepared by the ad hoc Western Utility Group identified a potential need for a Bonneville Power

Administration (BPA) east to west powerline across central Grant County. Based on correspondence with BPA it now appears that the corridor should not be considered as a projected need in the John Day Planning Area due to construction of a BPA transmission line further north, potential for expanded use of an existing corridor to the south and reduced regional electric power consumption projections. Since this was the only known corridor proposal and right-of-way applications can be reviewed at any time, additional utility or transportation corridors will not be considered a major issue requiring detailed analysis in this RMP/EIS.

Recreation

This issue was eliminated from further study due to the low intensity of recreational use. A majority of the recreational use on public lands in Grant County is dispersed. Funding for new recreation facilities or maintenance is minimal and there is little evidence of demand for more BLM recreation sites at this time.

Minerals and Energy Resources

The RMP Area will continue to meet the existing demand for minerals and energy resources. In light of present and future national demands for minerals and energy, it is anticipated that mining and exploration activities may continue to increase. The anticipated need for permits, claims and leases will reflect this accelerated demand, however, current activity was not identified as a major issue and existing regulations and management programs provide adequate resource protection. Minimal or no constraints on mineral exploration and development in the RMP Area now exist and the need for such constraints has not been identified as an issue.

Management Guidance Common To All Alternatives

The following management guidance is applicable to, and thus constitutes a part of, all alternatives considered in detail. It is presented here to avoid repetition.

Soil, Water, and Air Program

Soil, water, and air quality would continue to be evaluated on a case-by-case basis as a part of project level planning. Such an evaluation would consider the significance of the proposed project and the sensitivity of soil, water, and air quality in the affected area. Stipulations would be attached as appropriate to ensure compatibility of projects with soil, water, and air resource management. Appendix G shows Best Forest Management

Practices (BFMPs) adopted for forestry activities, to protect soil and water resources.

Soils would be managed to maintain productivity and to minimize erosion. Corrective actions would take place, where practicable, to resolve erosive conditions.

Water quality would be maintained or improved in accordance with state and federal standards, including consultation with state agencies on proposed projects that may significantly affect water quality.

Energy and Minerals Program

Oil, Gas and Geothermal Leasing

All public land administered by BLM in the RMP Area is available for oil, gas and geothermal leasing. In most areas, leases would be issued with only standard stipulations attached. Special operating stipulations may be required to protect seasonal wildlife habitat and/or other sensitive resource values.

Locatable Minerals

All public land in the plan area would be open to mineral entry and development except 320 acres previously withdrawn (as power sites). Mineral exploration and development on public land will be regulated under 43 CFR 3809 to prevent unnecessary and undue degradation of the land.

Other Minerals

Salable minerals including common varieties of sand, gravel, stone, pumice, cinder and clay would be sold. The salable mineral program involves numerous existing quarries where sources of rock are used for road surfacing material and various types of fill. New quarry sites may be developed as needed, consistent with protection of other sensitive resources.

There is an active interest in numerous recreational minerals. These are minerals collected for ornamental purposes; e.g., obsidian, agate, petrified wood and invertebrate fossils. All public lands are open to recreational mineral collection unless the specific minerals are subject to prior rights, such as mining claims.

Fire Management Program

The BLM is concerned about two basic types of fires: wildfire and prescribed fire. The Burns District would continue fire suppression activities in Grant County. The primary fire protection

objective would continue to be control (of the fire), during the first burning period, of all wildfires on or threatening public land. The degree of fire suppression would depend on the priority of the resource values threatened, and available equipment, personnel, and current and expected weather conditions. Prescribed fire shall be used as a management tool for various resource programs but would be constrained by an environmental analysis process and required approved burn plan. Prescribed fires will be coordinated with Oregon Department of Forestry and adjacent landowners.

Cultural Resources

Cultural resources will continue to be inventoried, recorded and evaluated as part of project planning. The evaluation phase will consider the significance of the proposed action and the sensitivity of those cultural resources known to exist in the affected area. Stipulations will be incorporated as appropriate, to ensure compatibility of project designs with management objectives for cultural resources.

Botanical Resources

Presently there are no Threatened and Endangered (T&E) plants in the RMP area. However, 12 plant species are under review for possible listing as T&E (see Table 3-3). If listing does occur the Bureau will protect known or suspected habitats. To identify any potential impacts on those plants, BLM will continue to conduct surveys before any significant ground disturbing activity takes place (see Appendix B, Standard Operating Procedures No. 4).

In addition, inventories will be conducted to further define population boundaries, essential habitat, and the distribution and abundance of plants. Wherever appropriate for protection or mitigation for T&E plants, design features for surface disturbing activities will be established.

The Silver Creek Research Natural Area (RNA) would continue to be managed for the enhancement of late seral stage big sagebrush-bluebunch wheatgrass and low sagebrush-Idaho fescue plant communities. Additionally, the Silver Creek RNA contains a Class III stream which is enhanced by 30 acres of Ponderosa Pine found adjacent to the stream.

Forestry Management

Commercial forestland within forest management units is broken down into two categories: No Planned Timber Harvest and Timber Production Base.

Forestland within the production base would be available, less those acres constrained, for a full range of forest management activities (see Appendix G). These activities include timber harvest as well as commercial and precommercial thinning. Environmental analysis will be required prior to initiating forest management activities in either category. The No Planned Timber Harvest category includes forestland that is set-aside for other resource values and forestland that is non operable.

Firewood gathering by individuals for home use will be permitted on most accessible forestland and woodland that is available for the harvest of products.

Timber contracts, usually awarded on a competitive basis, are the means of accomplishing all timber harvest and many forest development practices. The standard and special provisions (which include mitigating measures) in a contract set forth the performance standards to be followed by the contractor in carrying out the action in accordance with applicable laws, regulations and policies. In contract preparation, selection of special provisions is governed by the scope of the action to be undertaken and the physical characteristics of the specific site. The standard provisions of the basic timber sale contract, Bureau Form 5450-3, are applicable for all timber sales. Limitations on timber harvesting and related activities, as identified in the Church Report (U.S. Congress, Senate 1973) and analyzed in the BLM Timber Management Final EIS-1975, have been adopted by BLM. Bureau manuals and manual supplements provide a variety of approved special provisions for use, as appropriate, in individual contracts. The combination of selected special provisions constitutes Section 41 of the timber sale contract (Form 5450-3).

Range Management

Allotment Categorization

All grazing allotments in the RMP area have been assigned to one of three management categories based on present resource conditions and the potential for improvement (see Appendices E & F). The M category allotments generally will be managed to maintain current satisfactory resource conditions; I category allotments generally will be managed to improve resource conditions; and C category allotments will receive custodial management to prevent resource deterioration.

Allotment-Specific Objectives for the Improvement Category

Multiple-use management objectives have been

developed for allotments in the I category (see Appendix E). Future management actions, including approval of allotment management plans, will be tailored to meet these objectives. However, the priorities assigned to achieving objectives for wildlife habitat, watershed, vegetation condition, and livestock forage production differ among alternatives.

Implementing Changes in Allotment Management

Activity plans (AMPs/CRMPs) are commonly used to present, in detail, the types of changes required in an allotment, and to establish a schedule for implementation. Actions set forth under the plan that affect the environment will be analyzed and compared to alternative actions. During the analysis, the proposal may be altered or completely revamped to mitigate adverse impacts. The following sections contain discussions of the types of changes likely to be recommended in an activity plan and the guidance that applies to these administrative actions.

Livestock Use Adjustments

Livestock use adjustments are most often made by changing one or more of the following: the kind or class of livestock grazing an allotment, the period of use, the stocking rate, or the pattern of grazing. Target stocking rates have been set for each allotment in the Improve category (refer to Appendix F).

In reviewing the target stocking rate figures and other recommended changes, it is emphasized that the target AUM figures are not final stocking rates. All livestock use adjustments will be implemented as a result of the monitoring system.

Current BLM policy emphasizes the use of a systematic monitoring program to determine the need for livestock adjustments indicated by one-time inventory data. Monitoring will also be used to measure the changes brought about by new livestock management practices and to evaluate the effectiveness of management changes in meeting stated objectives.

Range Improvements and Treatments

Range improvements and treatments will be implemented under all alternatives. Typical range improvements and treatments and the general procedures to be followed in implementing them are described in Appendix B (see Table B-1). The extent, location, and timing of such actions will be based on the allotment-specific management objectives adopted through the resource management planning process; interdisciplinary

development and review of proposed actions; operator contributions; and BLM funding capability.

All allotments in which range improvement funds are to be spent will be subjected to an economic analysis. The analysis will be used to develop a final priority ranking of allotments for the commitment of the range improvement funds that are needed to implement activity plans.

Grazing Systems

Grazing systems will be implemented under all alternatives within I category allotments. The type of system to be implemented will be based on consideration of the following factors:

- allotment-specific management objectives (see Table E-1);

- resource characteristics, including vegetation potential and water availability;

- operator needs; and

- implementation costs.

Typical grazing systems available for consideration are described in Appendix C.

Unleased Tracts

Unleased tracts generally would remain available for further consideration for authorized grazing.

Wild Horse Program

Wild horses in the Murderer's Creek Herd will be inventoried regularly, which is in accordance with and is required by the Wild Free-Roaming Horse and Burro Act, Public Law 92-195.

Horse use adjustments will be made by the Bear Valley Ranger District, U.S. Forest Service, when herd numbers reach the target level.

Wildlife and Fish Program

General

Impacts to fish and wildlife habitat will continue to be evaluated on a case-by-case basis as a part of project level planning. Such evaluation will consider the significance of the proposed project and the sensitivity of fish and wildlife habitat in the affected area. Stipulations will be attached as appropriate to assure compatibility of projects with

management objectives for fish and wildlife habitat. Habitat improvement projects would be implemented where appropriate to stabilize and/or improve unsatisfactory or declining fish and wildlife habitat condition. Such projects would be identified through habitat management plans or coordinated resource management activity plans.

Threatened, Endangered, and Sensitive Species Habitat

No activities will be permitted in habitat for threatened and endangered species that would jeopardize the continued existence of such species.

Whenever possible, management activities in habitat for threatened, endangered, or sensitive species will be designed to benefit those species through habitat improvement.

The U.S. Fish and Wildlife Service will be consulted prior to implementing projects that may affect habitat for any threatened and endangered species. If a may-affect-situation is determined through the BLM project analysis process then consultation with the U.S. Fish and Wildlife Service will be initiated as per Section 7 of the Endangered Species Act of 1973, as amended.

Terrestrial Wildlife Habitat

Sufficient forage and cover will be provided for wildlife in areas of seasonal habitat. Forage and cover requirements would be incorporated into activity plans and would be specific to areas of primary wildlife use.

Range improvements generally would be designed to achieve both wildlife and grazing management objectives (see Appendix B).

Vegetative manipulation projects would be designed to minimize impact on wildlife habitat and to improve it whenever possible. The ODF&W and others will be consulted during analysis and in advance of all vegetative manipulation projects.

Management actions within floodplains and wetlands will include measures to preserve, protect, and if necessary, restore their natural functions (as required by Executive Orders 11988 and 11990). Management techniques will be used to minimize the degradation of stream banks and the loss of riparian vegetation. Bridges and culverts will be designed and installed to maintain adequate fish passage. Riparian habitat needs will be taken into consideration in developing livestock grazing systems and pasture designs (see Appendix J).

Wildlife reintroductions and fish stocking proposals will be evaluated and recommendations will be made to the Oregon Department of Fish & Wildlife.

Aquatic Habitat

The John Day Basin is extremely important in terms of supporting wild runs of anadromous fish as well as resident populations of both warm and cold water species. A great deal of angling interest exists for all game species found in the basin. Management priorities and techniques are discussed below.

Intensive Management

Streams which support or have the potential to support anadromous fish would be intensively managed to improve the existing fisheries resource. Specific management objectives and actions can be found in the John Day Basin Aquatic Habitat Management Plan. Due to the expected 10-year time period required for full implementation of the HMP, priorities have been established with the cooperation of ODF&W, U.S. Forest Service, and Confederated Tribes of the Umatilla Indian Reservation. These priorities for management (and expenditures) are based on the following criteria:

1. the importance of the drainage to anadromous fish runs in relation to the entire John Day River Basin;
2. the existing condition of the aquatic habitat;
3. the potential for response with management; and
4. the percentage of the stream on public lands.

All streams would eventually be improved but their priority would depend on their ranking when evaluated with the above criteria.

Types of habitat management practices that may be used to improve the fisheries would include:

1. stabilizing eroding streambanks with rock riprap, juniper placement and/or revegetation,
2. constructing fences to restrict livestock from damaged riparian areas;
3. creating spawning and rearing areas with instream placement of log and rock weirs, log and rock deflectors and boulders;

4. removing debris that restricts flow or fish migration;

5. providing fish passage over barriers to migration movements;

6. working with other agencies or landowners on a cooperative basis to improve aquatic habitat; and

7. providing protection by imposing restrictions on surface disturbing activities (see Nonintensive Management).

Nonintensive Management

Nonintensive management would be practiced on streams not covered under intensive management.

Types of restrictions or management practices to protect fish habitat which enhances the fisheries resource may include:

1. leaving buffer strips of vegetation between streams and areas of surface disturbance, e.g., road construction, surface mining, or logging operations,
2. building sediment gathering structures to prevent sediment from entering streams from surface disturbing activities,
3. locating roads out of riparian or wetland areas. Roads crossing streams would be positioned so as to cause minimal damage to riparian, stream, or wetland habitat and to provide for unobstructed migration of fish,
4. restricting livestock from using riparian areas,
5. preventing debris or toxic materials from entering stream.

Cadastral Survey and Engineering Programs

Cadastral surveys and engineering activities will continue to be conducted in support of resource management programs. Surveying and engineering requirements and priorities will be determined on a yearly basis as a part of the annual work planning process.

Road Maintenance Program

Road maintenance would continue to be

conducted in support of resource management objectives. Maintenance requirements and priorities would be determined on a yearly basis as a part of the annual work planning process.

Specific road maintenance would be determined based on consideration of the following criteria:

Resource management needs;

User safety;

Impacts to environmental values, including but not limited to wildlife and fisheries habitat, soil stability, recreation, and scenery; and maintenance costs.

Lands

The Lands program includes actions involving: land disposals by sale and/or exchange, acquisition by purchase and/or exchange, provision for rights-of-way including multiple-use and single-use utility/transportation corridors, communication sites, roads, issuance of leases and/or patents for Recreation and Public Purposes Act and other permit or lease for occupancy and development of public lands (see Appendix K for criteria).

Withdrawal Review

Review of other agency withdrawals will be completed by 1991. These withdrawals will be continued, modified, or revoked. Upon revocation or modification, part or all of the withdrawn land will revert to BLM management.

Current BLM policy is to minimize the acreage of public land withdrawn from mining and mineral leasing, and, where applicable, to replace existing withdrawals with rights-of-way, leases, permits, or cooperative agreements.

Utility and Transportation Corridors

Public land will be available for utility and transportation corridor development. All existing corridors will be designated without further review. Corridor widths vary, but are a minimum of 2,000 feet. Proposed corridors will be considered on a case-by-case and site-specific basis. Applicants will be encouraged to locate new facilities within existing corridors to the extent possible.

Easement Acquisition

Easements are acquired to benefit timber, range management, recreation, and other programs.

Easement needs will be decided on a case-by-case basis.

Recreation Program

A broad range of outdoor recreation opportunities will continue to be provided for all segments of the public commensurate with demand. Means of public access will be permitted where appropriate to enhance recreation opportunities and allow public use. Recreation resources will continue to be evaluated on a case-by-case basis as a part of project level planning. Developed recreation sites that cannot be maintained to acceptable health and safety standards will be closed until deficiencies are corrected. Investment of public funds for new recreation developments will be permitted only on land identified for retention in public ownership.

Seasonal vehicle restrictions would continue to be applied in Murderer's Creek Cooperative Wildlife Management Area. Seasonal vehicle (ORV, snowmobile, etc.) restrictions will be applied as needed to mitigate impacts of human activities on wildlife and important seasonal wildlife habitat.

Visual Resources

Visual resources would continue to be evaluated as a part of activity and project planning. Such evaluation will consider the significance of the proposed project and the visual sensitivity of the affected area. Stipulations will be attached as appropriate to assure compatibility of projects with management objectives for visual resources.

Management Direction by Alternative

The components of each resource program are displayed in summary for each alternative in Table 2-6. The table compares the components by alternative showing management emphasis and/or units of output. The purpose of this section is to focus the reader's attention on the major difference between the alternatives, thus providing a clearer basis for comparison and, ultimately, for the rationale behind choosing the Preferred Alternative.

Table 2-6 Management Direction by Alternative

Soil and Watershed Management Direction

Management Component	Preferred Alternative (A)	Production Alternative (B)	Enhancement Alternative (C)	No Action Alternative (D)
Management Systems	<p>Livestock grazing would be coordinated to enhance fisheries in those pastures containing perennial streams.</p> <p>ORV and heavy equipment use would be restricted or excluded from riparian zones of all perennial streams. Additionally, ORV and heavy equipment use would be restricted on highly erosive soils.</p> <p>Reservoirs and spring areas with associated embankments, where technically and economically feasible, would be fenced. The resulting water supply would be piped to nearby troughs.</p> <p>Allows for improvement of water quality of the South Fork of the John Day River by acquisition by exchange of private property for sediment pond(s).</p>	<p>Livestock would continue to graze in all riparian zones but would be managed in fenced pastures associated with streams and rivers within 1 allotments.</p>	<p>Livestock grazing would be restricted or excluded from riparian zones.</p> <p>Same as A.</p> <p>Same as A.</p> <p>Same as A.</p>	<p>Same as B plus exclude livestock use within existing exclosures.</p>

Management practices in all four alternatives would be designed to protect and improve water quality, soils productivity and control erosion. Proposed projects, including roads, would be designed and maintained to reduce impacts on water quality and soil erosion. All alternatives would meet the minimum legal requirements dealing with water quality.

Grazing Management Direction

Component	Alternative A	Alternative B	Alternative C	Alternative D
Forage Use				
- Short Term	Continue to make available 25,323 AUMs of forage to livestock on existing allotments (See Appendix F). Temporary reductions may be necessary due to implementation of range improvements. Any surplus in competitive forage will be provided to livestock before wildlife where big game population targets are exceeded.	Same as A, plus exclude wild horse grazing use on BLM lands and provide an additional 240 AUMs to livestock in the affected allotments.	Eliminate 5,061 AUMs of livestock grazing in the Murderers Creek Herd Management Area (affects 7 allotments). Continue to authorize the current level of livestock use in all other allotments. Temporary reductions may be necessary to the implementation of range and wildlife improvements. Any surplus competitive forage will be used by wildlife.	Same as A.
- Long Term ¹	Continue to make available 25,323 AUMs plus a 0-10% increase in AUMs on I Allotments.	Increase livestock uses by 25% on I allotments and continue existing level of authorization on all others.	Reduce current livestock forage use by 25% in I category allotments and continue existing level of authorization on all other allotments.	Continue to make 25,323 AUMs of livestock forage available.
Management Plans or Systems	Maintain all existing AMPs. Implement new or revised AMPs or grazing management systems on I allotments.	Maintain all existing AMPs. Implement AMPs/grazing management systems where potential for resource improvement and sufficient manageability exists.	Manage livestock grazing to maintain or enhance natural systems by developing activity plans as appropriate.	Revise and maintain AMPs/grazing systems on a case by case basis.
Range Improvements	Where cost effective and potential exists for resource improvement, implement range improvement on I allotments (See Appendix B, Table B-1). Expected potential long term increase is 10 percent.	Implement all technically feasible range improvements. Expected potential long term increase is 25 percent.	Implement range improvements only when cost effective, would enhance natural values or would mitigate conflicts.	Implement range improvements proposed in existing activity plans.
Riparian Management	Graze riparian areas according to AMPs/CRMPs to protect water quality and enhance fisheries.	Same as A. Additionally grazing use may be intensified in riparian areas by fencing these areas into pastures.	Restrict or exclude livestock from all perennial streams and other important riparian areas.	Same as A.

¹ The percentage of livestock forage allocation displayed are estimates and are for analysis purposes only.

Wild Horse Management Direction

Management Component	Alternative A	Alternative B	Alternative C	Alternative D
Murderers Creek Wild Horse Herd Numbers	No change from existing situation, Alt. D	Herd numbers would be reduced or excluded from BLM administered land.	Herd numbers would be allowed to increase to 522.	Maintained near 100 head.
HMA Size and Boundary Location	Includes all of grazing allotment number 4020 south of Aldrich Mtn.	Same as A.	Same as existing situation, Alt. D.	Includes all of grazing allotment numbers 4164, 4154, 4044 and portions of numbers 4052, 4020, 4103 and 4186.
Forage Use	240 AUMs.	No use	A maximum of 5061 additional AUMs.	240 AUMs.

Wildlife and Fish Habitat Management Direction

Component	Alternative A	Alternative B	Alternative C	Alternative D
Riparian Zones	Coordinate livestock use on 28.5 miles of riparian zone within 1 allotments to enhance natural values.	Livestock would continue to graze in all riparian zones but would be managed in fenced zones associated with streams and rivers within 1 allotments.	Restrict and/or exclude livestock from 76 miles of riparian zone via management and/or fencing for all allotments.	Same as B plus exclude livestock use within existing exclosures.
	During timber harvesting retain buffer strip on streams supporting or having significant potential to support fish.	During timber harvesting retain minimal buffer strip on streams supporting or having significant potential to support fish.	Same as A but distances will be tripled.	Buffer strips are determined on a case by case basis by resource specialists.
	Utilize existing road system and limit new permanent road entries with emphasis on special harvest techniques.	Utilize existing road system and severely limit new permanent road entries with emphasis on special harvest techniques.	Same as A.	Road construction and maintenance are determined on a case by case basis by resource specialists.
Raptors	Restrict human activity adjacent to active nesting and roosting areas during specific periods of the year.	No restrictions on human activities (equipment operation, logging, etc.) adjacent to nesting and roosting sites.	No activity within a half-mile of nesting and roosting sites within specific periods of the year.	Restrictions determined on a case by case basis.
Big Game	Alter the intensity of forest management and livestock grazing use to enhance big game habitat.	Alter the intensity of forest management and livestock grazing use to provide the minimum amount of crucial habitat.	Alter the intensity of forest management and livestock raising use to provide a maximum of crucial habitat.	Restrictions determined on a case by case basis.
Anadromous and Resident Fisheries	Expand steelhead territory by providing passage through man-made and natural barriers. Construct weirs, deflectors and place boulders in streams containing trout and/or anadromous fisheries where pool to riffle ratio is insufficient.	Expand steelhead territory by providing passage through Izee Falls.	Same as A.	Same as A.
	Construct and develop fresh water impoundments to provide cold and warm water fisheries with provisions for other downstream demands. Restrict development to existing legal access. Exchange of lands to increase and/or expand wildlife habitat.	Construct and develop fresh water impoundments to provide cold and warm water fisheries with provisions for other downstream demands.	Same as A plus fence all developments. Acquire by exchange, lands to increase and/or expand wildlife habitat.	Development on a case by case basis.
Habitat Diversity	Maintain and, as the opportunity arises, manage to improve the current level of habitat diversity.	Minimize restrictions on management activities affecting habitat diversity.	Maximize habitat diversity by implementing and/or restricting management activities as appropriate.	Manage upland habitat for diversity to provide a variety of wildlife.
Wildlife Improvements	Implement planned seedings and juniper/bush control on 220 acres and 1320 acres, respectively. Implement seven wildlife water developments.	Same as A.	Same as A. Additionally implement other wildlife improvements deemed appropriate.	Same as A.

Forest Management Direction

Management Component	Alternative A	Alternative B	Alternative C	Alternative D
Timber Harvest ¹	<p>Alter the intensity of management on forest lands by providing consideration for the following:</p> <ul style="list-style-type: none"> -Critical lifeline forage and cover areas -Streams identified as supporting fisheries -All VRM Class I areas 	<p>Intensively manage forest lands with minimal constraints for protection of other resources.</p>	<p>Alter the intensity of management on forest lands by excluding harvest in the following areas:</p> <ul style="list-style-type: none"> -Riparian acres -Old growth stand -Streams -Wildlife cover and forage areas -VRM Class IV and above areas 	<p>Intensively manage present forest base. Include provisions of buffers for:</p> <ul style="list-style-type: none"> -Stream protection -Wildlife cover -Watershed protection -Other concerns as are identified
	Approximate annual sustainable harvest level would be 2.17 MMbf.	Approximate annual sustainable harvest level would be 2.21 MMbf.	Approximate annual sustainable harvest level would be 1.32 MMbf.	Approximate annual sustainable harvest level would be 2.20 MMbf. ²
Commercial Thinning	Thin stands within boundaries of annual sales where commercially feasible with a preference for ponderosa pine where appropriate. Leave some of these stands for the enhancement of other resources.	Commercially thin all suitable areas within timber sale boundaries with a preference for only ponderosa pine.	Commercial thinning only where consistent with other resource objectives.	Same as A.
Pre-Commercial	Thin approximately 200 acres per year.	Thin approximately 400 acres per year to maximize timber yields.	Thin only where consistent with other resource objectives.	Same as A.
Slash Treatment	During timber harvesting lop and scatter the light to moderate slash and pile heavy slash. Leave at least 12 tons per acre for nutrient replacement and dispose of most backlog slash concentrations in excess of 15 tons per acre, with prescribed fire. Incidental disposal of backlog slash by piling and burning.	Same as A but dispose of all backlog slash, where concentrations are in excess of 18 tons per acre; only where cost effective.	Dispose of all slash only where consistent with other resource values while maintaining standards and public safety.	Same as A.
Fuelwood Disposal	Dispose of some heavy slash buildups through firewood permits. Dispose of heavy concentrations of standing dead material through sale. Dispose of dead and down material through sale or free use.	Dispose of dead and down material and all heavy slash buildups through sales.	Dispose of some slash buildups but allow some to remain when they enhance other resource values.	Same as A.
Woodland Management	Sell woodland products when consistent with other resource values.	Optimize sale of woodland products.	Same as A.	Provide woodland products to meet demand.

¹ A new sustainable harvest level will be calculated as part of this planning effort and in conjunction with a forest inventory which is underway. The actual volume offered may be less than the full biological potential depending upon the number of acres allocated to other uses and the operational constraints built into this land use plan in order to meet multiple use objectives.

² This sustainable harvest level reflects current information and is substantially lower than the existing situation of 48,818 acres of forest land with a planned harvest yield of 3.4 MMbf.

Lands Program Direction

Component	Alternative A	Alternative B	Alternative C	Alternative D
Land Disposal by Priority ¹	Transfer to other agencies.	Same as A.	Same as A.	Same as A.
	Exchanges	Same as A.	Same as A.	Same as A.
	Sale of public land with the following exceptions:	Same as A without the following exceptions:	No sale of public land.	Existing public land disposal program (See Appendix A).
	-Forest lands	-Forestlands		
	-Riparian zones on streams supporting or having potential to support anadromous fisheries			
	-Recreation sites			
	-Bighorn sheep habitat			
	-Selective management categories M, I and C1			
	-Retention of S, T & E plant and animal habitat			
	-Significant big game habitat	-Significant big game habitat.		
Estimated Available Acres for Sale	5,240 ²	21,014 ²	-0-	36,779

¹ John Day Planning Unit only.

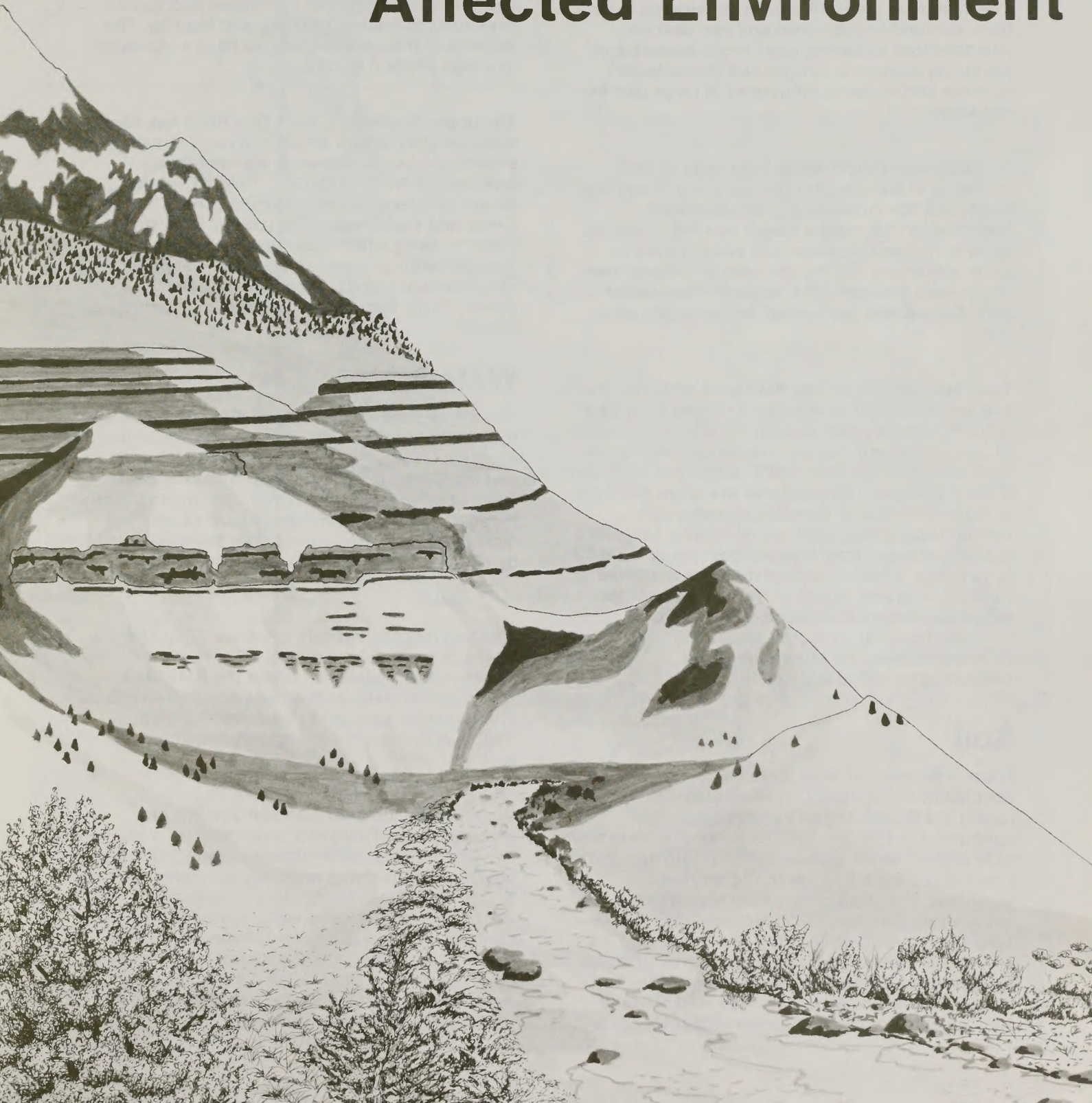
² An additional 16,000 acres may be available depending on a case by case analysis of significant big game habitat and forest management considerations.

Major Recreation Program Direction

Component	Alternative A	Alternative B	Alternative C	Alternative D
Off-Road Vehicles (ORV)	Allow ORV use in all areas except for identified seasonal closures (Murderer's Creek Cooperative Area).	Same as A.	Same as A.	Same as A.
	Snowmobile use would be closed on those big game winter ranges and other sensitive areas should wildlife harassment and/or resource damage occur.	Same as A.	Same as A.	No restrictions.
	Designate and fence a specific area above Canyon City for intensive ORV use, especially motorcycles.	Same as A.	Same as A.	No designation.
Sports Fisheries	Same as B plus access must be presently utilized. Fishing opportunities may increase from exchange program.	Develop slack water fisheries provided there is no negative impact to existing fisheries.	Same as B plus fence all developments. Fishing opportunities may increase from acquisition and exchange program.	Develop fisheries on a case by case basis.
Facilities/Developed Sites	Manage for dispersed recreation and underdeveloped sites. Maintenance of two developed sites would be turned over to cooperators or facilities would be removed.	Develop intensive recreational sites provided they are cost effective. Maintain or improve existing recreation sites.	Within wildlife and aesthetic constraints develop environmental education sites and trails. Maintain existing recreation sites.	Maintain existing recreation sites.
Public Access	Acquire public access across private land only where benefits outweigh costs or via land exchange and private cooperation.	Acquire public access across private land to bureau lands.	Access obtained via private cooperation and land exchange.	Access obtained through easement acquisition or land exchange.
Visual Resource Management (VRM)	Continue existing management practices. Mitigate impacts to meet visual resource objectives.	Same as A.	Same as A.	Same as A.

Chapter 3

Affected Environment



1. Introduction

This chapter provides a discussion by resource of the affected environment. Emphasis has been placed on those resource components most likely to be impacted if any of the alternatives were implemented. This information is summarized from the Management Situation Analysis (MSA) document on file at the Burns BLM District Office (see Map 2).

Climate

The climate in the RMP area is considered to vary from semiarid to subhumid and can best be characterized as having cool, moist winters and warm, dry summers. Length and character of summer and winter is influenced in large part by elevation.

Annual precipitation varies from lows of 11.3 inches to 11.9 inches at Dayville, Long Creek and Seneca to 30+ inches at higher elevations. Precipitation during the winter months comes as snow at higher elevations and snow or rain at lower elevations. Spring showers of snow or rain occur April through June, while the months of July, August and September are generally quite dry.

Temperature data for the RMP area indicates the average annual air temperature ranges from 39.8° to 51°F in most years. During the summer months of June, July, and August it is not uncommon to have temperatures over 100°F within the John Day River drainages. Temperatures are more moderate at higher elevations. Growing seasons vary considerably throughout the RMP area. Dayville's growing season (frost free period) ranges from 83 to 141 days, while in Seneca it can be expected to freeze during any month of the year. Winter low temperatures can be expected to be below freezing, however, at higher elevations temperatures can be more severe, e.g., temperatures at Seneca may reach -40°F.

Soil

There have been at least three soil surveys conducted in the John Day RMP area. The most recent is a BLM Soil and Vegetation Survey conducted in 1981 on 138,872 acres of private and BLM administered land along the South and Main Forks of the John Day River and on Rudio Mountain. The most generalized survey was released by the State Water Resources Board in 1969 (Dyksterhuis et al. 1969) and covers the entire RMP area. A more detailed survey of lands along the John Day River was published by the Soil Conservation Service in 1981 (Dyksterhuis 1981). Applying the Soil Conservation Service's

generalized description of soil associations from their 1981 report, the majority of the soils in the RMP area can be grouped into eight categories. (See Table 3-1.)

The erosion hazard of these soils varies from slight to severe depending on the following factors: precipitation (amount, intensity, duration and time), season, slope, soil characteristics and vegetative condition and type. Other factors which influence a soil's susceptibility for erosion are past and present management practices and various uses such as mining, grazing, and logging. The majority of the soils in this area have a moderate or a high erosion hazard.

The upper South Fork John Day River has severe to moderately severe sheet, gully and stream bank erosion, and commensurate sedimentation problems (SWCC 1973; DEQ 1976). The most severe problems are in the Lewis Creek, Corral Creek and Flat Creek areas (USDA-SCS 1979). Other streams which, over time, may develop sedimentation problems due to the watershed condition are Franks, Scotty, Marks, Belshaw, Beech, Grub, Rudio, Cottonwood and Holmes Creeks.

Water

The major streams in the John Day RMP area are the North, Middle, Main and South Forks of the John Day River, Middle Fork of the Malheur River and the Silvies River. The majority of the peak flows occur between April and June in most years. Flood problems within this area are caused by high winter or spring runoff from snowmelt, and/or by cloudbursts which occur June to August.

Existing records indicate there are 77 BLM water developments (34 reservoirs, 28 springs, 14 guzzlers and 1 pipeline) within the RMP area. There are no wells on the BLM administered land. Data from 66 wells in the surrounding area indicates that depths to water varies from 12 to 604 feet.




Water quality data for selected streams are summarized in Table H-5 (Appendix H). Values for most of the parameters tested are within ranges which are considered relatively normal for streams of this type. Values indicating increased sediment deposition and elevated water temperatures are of concern. Water quality problems exist in many streams within the John Day RMP area; however, opportunities for BLM to maintain and/or improve water quality are limited due to the scattered locations of BLM-managed lands.

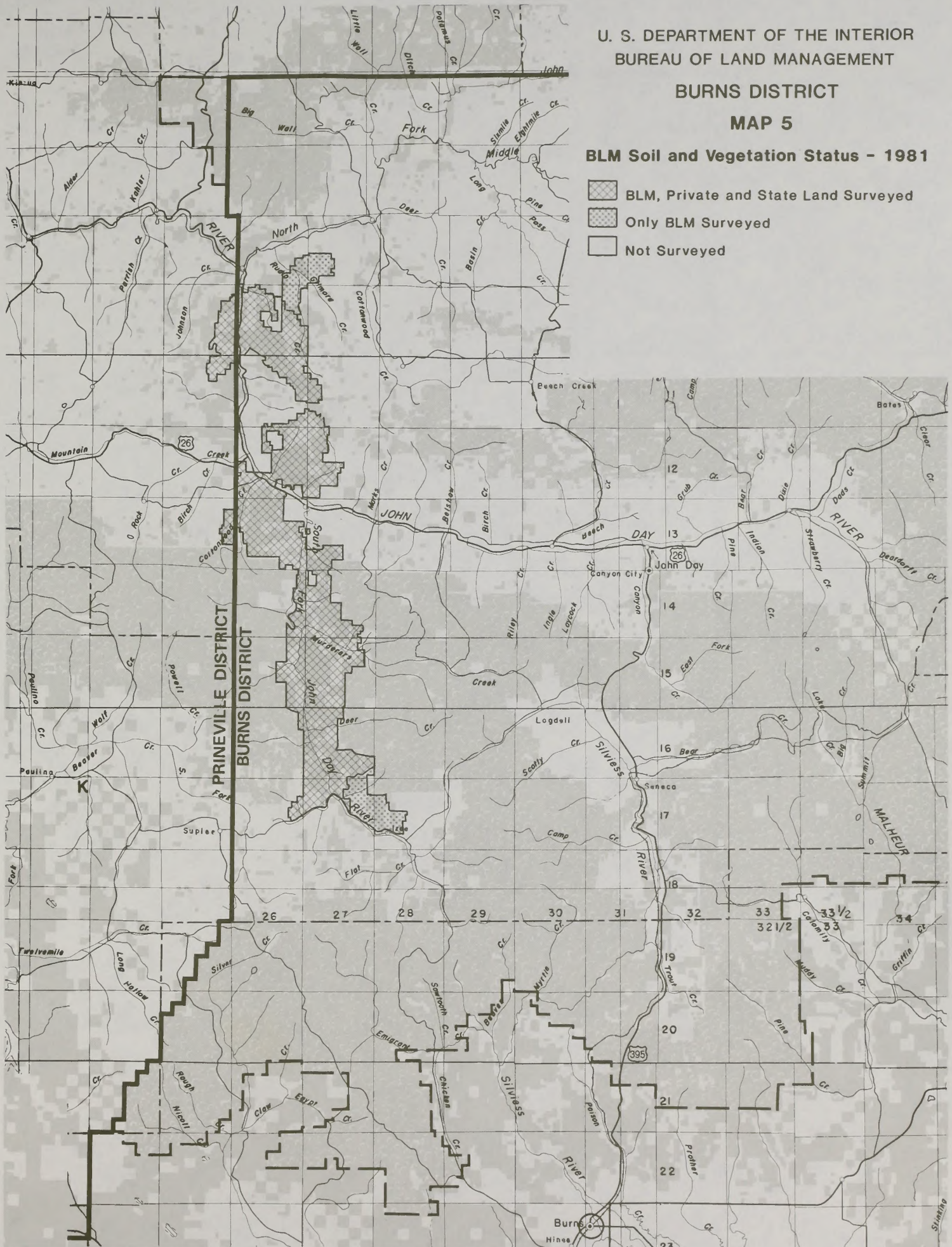
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MAP 5

BLM Soil and Vegetation Status - 1981

-  BLM, Private and State Land Surveyed
-  Only BLM Surveyed
-  Not Surveyed

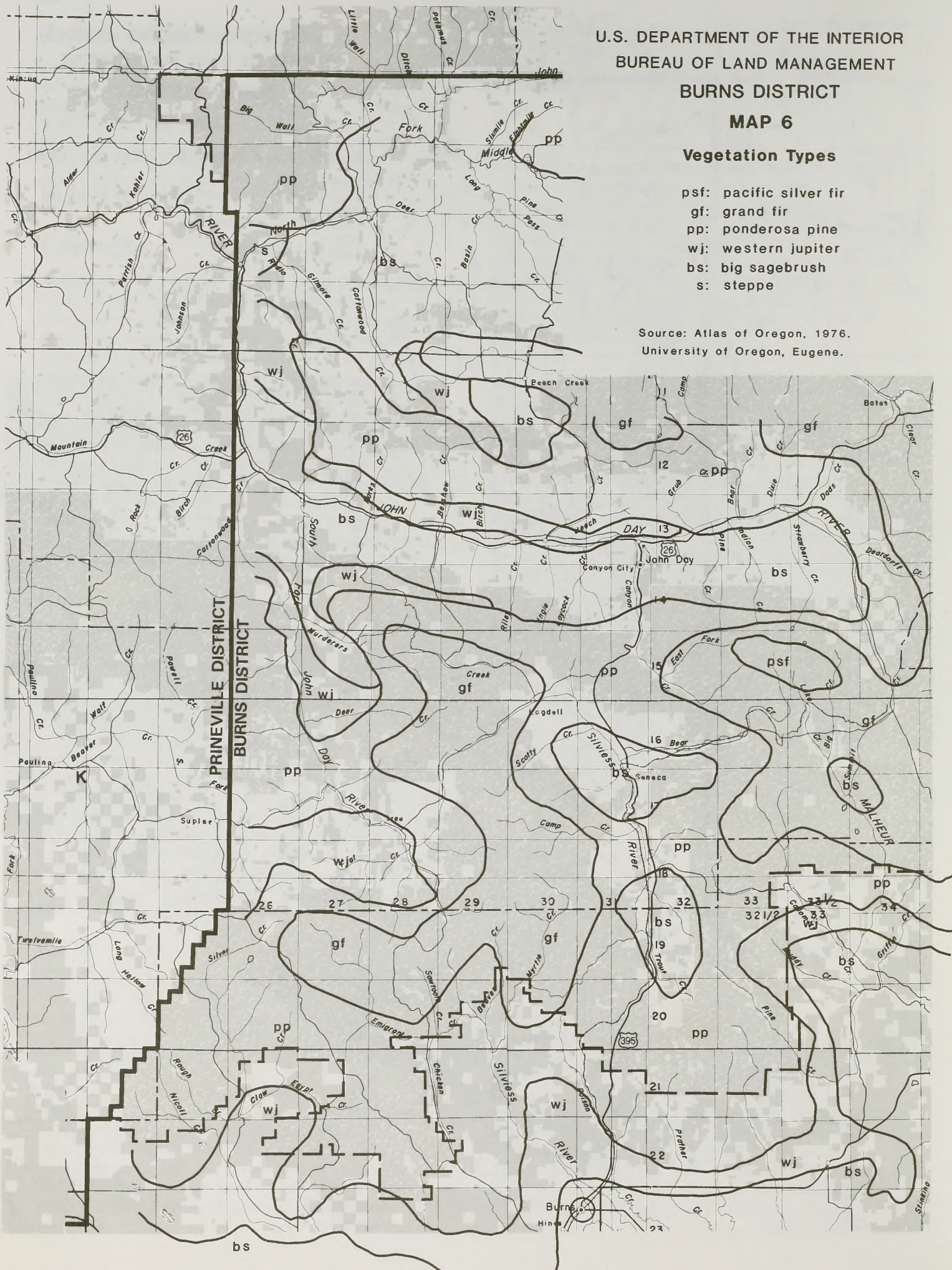


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MAP 6

Vegetation Types

psf: pacific silver fir
gf: grand fir
pp: ponderosa pine
wj: western juniper
bs: big sagebrush
s: steppe

Source: Atlas of Oregon, 1976.
University of Oregon, Eugene.



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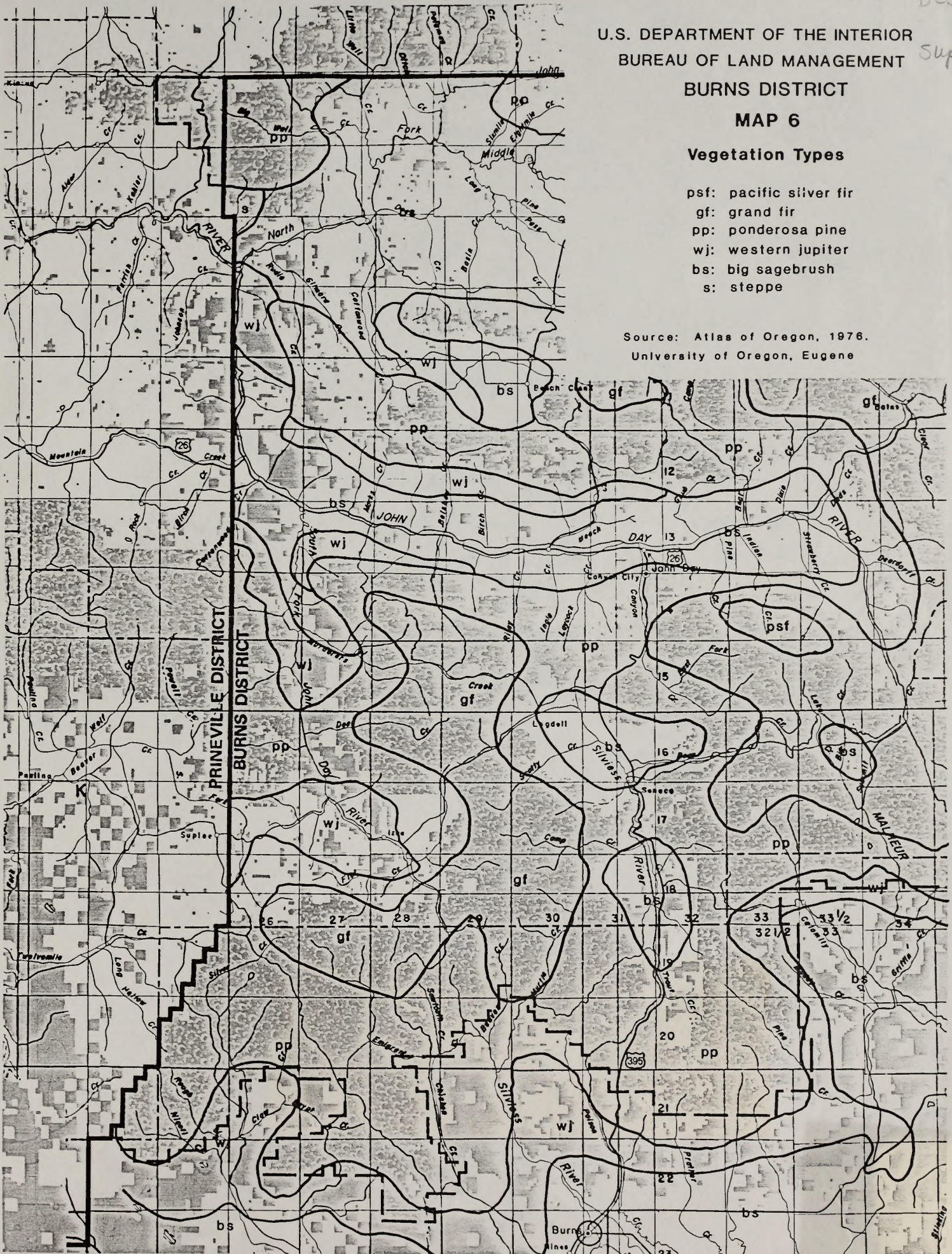
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MAP 6

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John Day Resource Management Plan

Map Reprint

Because Map 6 - Vegetation Types, page 38 was printed erroneously, it has been reprinted as a supplement to the draft EIS.

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Table 3-1 Generalized Soil Groupings Based on Soil and Environmental Characteristics*

Position	Drainage Class	Depth	Textures	Precipitation (ins)	Ave Slope(%)	Erosion Hazards
Floodplains & alluvial fans	Well to somewhat poorly drained	Deep	Loams to silt loams	12 to 18	0 to 20	Slight to moderate
Over bedrock on uplands	Well drained	Shallow	Very stony or extremely stony loams & silt loams	11 to 20	2 to 70	Moderate to high
Over hardpans on terraces	Well drained	Shallow & moderately deep	Very stony & extremely stony silty clay loams	14 to 18	2 to 70	Slight to high
On uplands	Well drained	Deep	Clay loams & stony & very stony clay loams	10 to 14	3 to 65	Slight to high
Over bedrock on uplands	Well drained	Shallow & moderately deep	Stony to extremely stony silty clay loams	13 to 20	2 to 50	Moderate to high
Over serpentine on uplands	Well drained	Moderately Deep loams	Stony & very stony clay	17 to 24	3 to 75	Moderate to high
Over highly fracture shale on uplands	Well drained	Deep	Very shaley loams	17 to 24	3 to 75	Moderate to high
On uplands	Well drained	Moderately deep & deep	Loams, silty clay loams, stony over loams	16 to 30	2 to 75	Moderate to high

*This material is from SCS, Soil Survey of Grant County Central Part. Generally speaking this information should apply to the majority of BLM Lands in RMP Area.

Vegetation

Vegetation Zones

Vegetation within the John Day RMP Area shows great diversity due to climate, topography, soils, biological influences, and incidence of fire. The RMP area is covered by two provinces, forest and shrub-steppe, which are subdivided into six vegetation zones; grand fir, ponderosa pine, Pacific silver fir, western juniper, big sagebrush, and steppe (see Map 5) (Loy, Patton, Plank and Allan 1976).

A zone, as used here, is the area within which a given species or group of species become dominant under normal natural conditions — that is, in the absence of major human disturbance.

However, human disturbance is obvious through such practices as logging, burning, grazing and farming. As a consequence, the dominant species shown on Map 5 may not presently be the dominant species. Also, each vegetation zone contains a lot of variability due to intermingling of vegetation along adjacent zones and the appearance of plant associations. Plant associations may develop within a zone based upon site conditions of that locale, e.g., pockets of ponderosa pine within the grand fir zone.

See Table 3-2 for the amount of public land in the vegetation zones in the John Day RMP Area.

Table 3-2 Vegetation Zones

Zone	Public Land Acres	Percent of RMP Area	Common Plant Species
Grand Fir	1,680	0.9	Douglas fir, Ponderosa pine, Western Larch, strawberry, twin-flower, huckleberry
Ponderosa Pine	70,854	37.0	Douglas fir, curlleaf mahogany, bitterbrush, Idaho fescue, bluebunch wheatgrass, elk sedge, pinegrass, arnica
Western Juniper	52,300	27.0	Ponderosa pine, curlleaf mahogany, bitterbrush, big sagebrush, bluebunch wheatgrass, Sandberg's bluegrass
Big Sagebrush	65,810	35.0	Western juniper, low sagebrush, stiff sagebrush, bluebunch wheat bluegrass
Steppe	120	0.1	Big sagebrush, Idaho fescue, bluebunch wheatgrass, variety of forbs and annuals.

Threatened or Endangered Plant Species

No plants in the RMP area are presently listed as threatened or endangered under the Endangered Species Act. Twelve plant species that are under review by the U.S. Fish and Wildlife Service for possible listing as endangered or threatened status (45 FR 82480) have either been sighted or are suspected to occur in the RMP area. See Table 3-3.

Table 3-3 Plant Species Under Review for Nomination for Threatened or Endangered Status¹

Scientific Name for Plant Species	Notice Review Category ²
<i>Lomatium laevigatum</i>	2
<i>Lunia serpentina</i>	1
<i>Rorippa columbiae</i>	2
<i>Astragalus diaphanus</i>	2
<i>Thelypodium eucosmum</i>	2
<i>Silene scaposa</i> var. <i>scaposa</i>	2
<i>Astragalus tegetarioides</i>	2
<i>Lupinus biddlei</i>	2
<i>Lupinus cusickii</i>	2
<i>Collomia macrocalyx</i>	2
<i>Eriogonum prociduum</i>	2
<i>Castilleja xanthotricha</i>	2

¹ As published in "Endangered and Threatened Wildlife and Plants: Review of Plant Taxa for listing as Endangered or Threatened Species" Federal Register Vol. 45, No. 24, 12/15/80 and Vol. 48, No. 229, 11/28/83.

² Category 1 = Sufficient biological justification exists for listing as endangered or threatened status.

Category 2 = Further study is needed to determine if biological justification for listing exists.

Categories are subject to change as new information becomes available.

Range Condition

Range condition is the present state of the vegetation of a range site in relation to the climax plant community for that site. It is an expression of how nearly the present plant community resembles the original community in its highest state of ecological development (see Appendices E and F).

In 1981, 82,451 acres of public lands were surveyed for range condition as defined above. (See Procedures in Soil Conservation Service's (SCS) National Range Handbook 1976). It was the intent of this survey to concentrate on the larger blocks of public land. See Map 6.

The results of this survey are shown in Table 3-4 and in Appendix F.

The remaining 99,669 unsurveyed acres of public land are in small tracts scattered throughout the RMP area. These tracts were not surveyed because of the cost; however, surveys will be done on tracts identified as needing special attention on a case-by-case basis.

Table 3-4 General Range Conditions in the Soil and Vegetation Survey Area

Condition (Successional Stage)	Public Land
Late Seral	18,764
Middle Seral	36,525
Early Seral	22,361
N*	4,801
Total	82,451

*N = Not classified, e.g., Rock Outcrop

Livestock

In the John Day RMP Area, 25,323 AUMs of livestock use are presently authorized on 157 allotments which contain 180,096 acres of public land, 142 permittees/lessees graze livestock in these allotments. The locations of M, I and C category allotments are shown on the John Day RMP Selective Management Map 7 and Table 3-5. Table F-1 in Appendix F displays the current livestock authorization and existing range condition for each allotment in the planning area.

Seven allotments in the John Day Planning Area are being grazed under Allotment Management Plans (AMPs) or Coordinated Resource Management Plans (CRMPs). (See Table 3-6). These AMP/CRMP allotments account for 25 percent of the leased acres, and 27 percent of the AUMs in the planning area. All of the AMPs/CRMPs employ rest rotation or deferred rotation grazing systems. Four out of the seven AMPs/CRMPs still require a substantial investment in the form of range improvements before they are fully implemented.

Table 3-5 Summary of Allotment Categorization

Category	Number	Acres	Existing Licensed Use AUMs
Maintain	3	28,990	4,580
Improve	14	56,042	8,227
Custodial C1	18	46,852	6,184
Custodial C2	122	48,212	6,332
Unallotted		3,679	
Totals *	157	183,775	25,323

* Burns District administers 5,495 acres in Prineville District and 40 acres in the Vale District. Approximately 2,320 acres and 1,560 acres of the Burns District is administered by Prineville and Vale Districts, respectively.

Table 3-6 Allotments With AMPs/CRMPs and Current Range Condition

Allotment No.	Name	Active Pref	Acres P.L.	Successional Stage (% of P.L.)			
				Late Seral	Middle Seral	Early Seral	Unclassified
4007	Windy Point	407	2,514	22	45	24	9
4020	Murderer's Cr	2,000	17,315	13	52	33	2
4049	Battle Creek	830	4,958	15	56	28	1
4086	Rudio Mountain	590	3,860	47	50	1	2
4120	Ferris Creek	280	3,177	15	33	47	5
4143	Silvies	2,500	11,035				100
4164	Corral Gulch	318	2,653	0	38	53	9
Total		6,925	45,512				

AMPs = Allotment Management Plans
CRMPs = Coordinated Resource Management Plans
P.L. = Public Land

There are approximately 75 tracts of public land encompassing approximately 3,679 acres within the planning area on which no grazing is authorized. These are usually small parcels of public land that are unsuitable or inaccessible for livestock grazing.

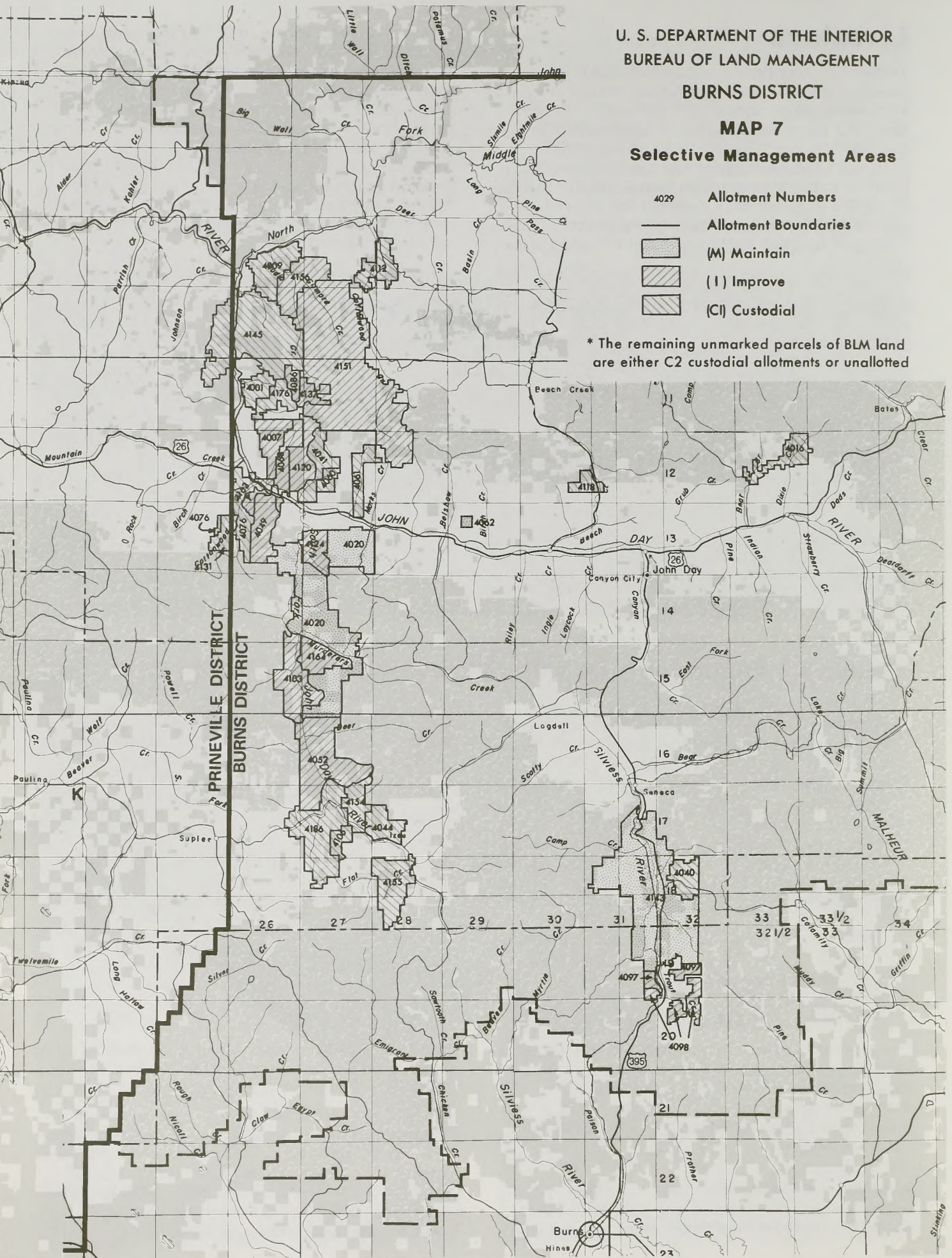
Although the Bureau issues some grazing authorizations that include late fall through early spring grazing, the great majority of the licensed

use occurs between May 1 and November 30. Most allotments are comprised of intermingled private, state, U.S. Forest Service, and public land.

There are a variety of range improvements on large and small allotments. Range improvements normally consist of, but are not limited to springs, reservoirs, fences, pipelines, cattleguards, and vegetation manipulation. To date in the John Day RMP Area, the BLM has recorded 155 range related improvements (see Appendix B).

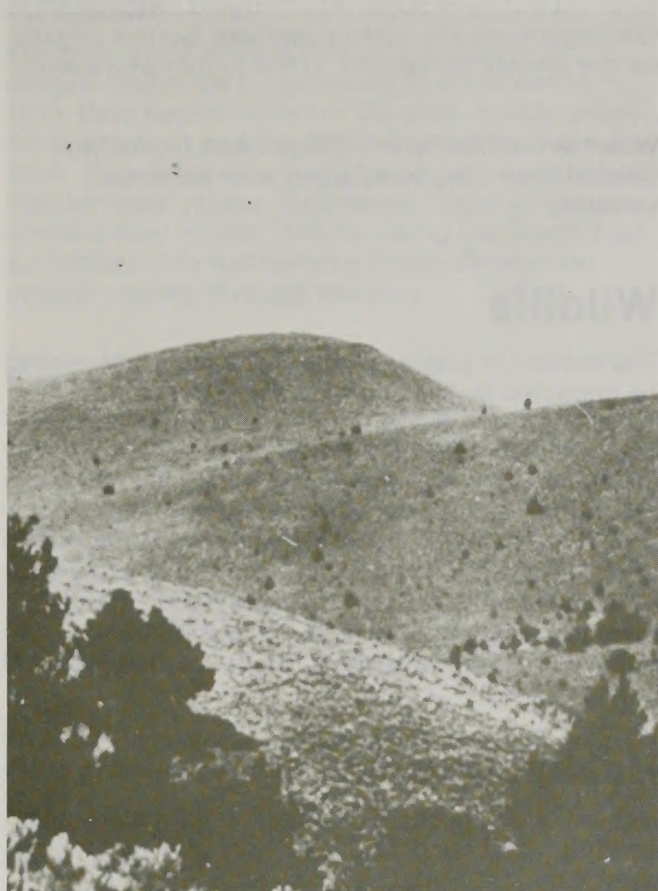
Selective Management Areas

(CI) Custodial

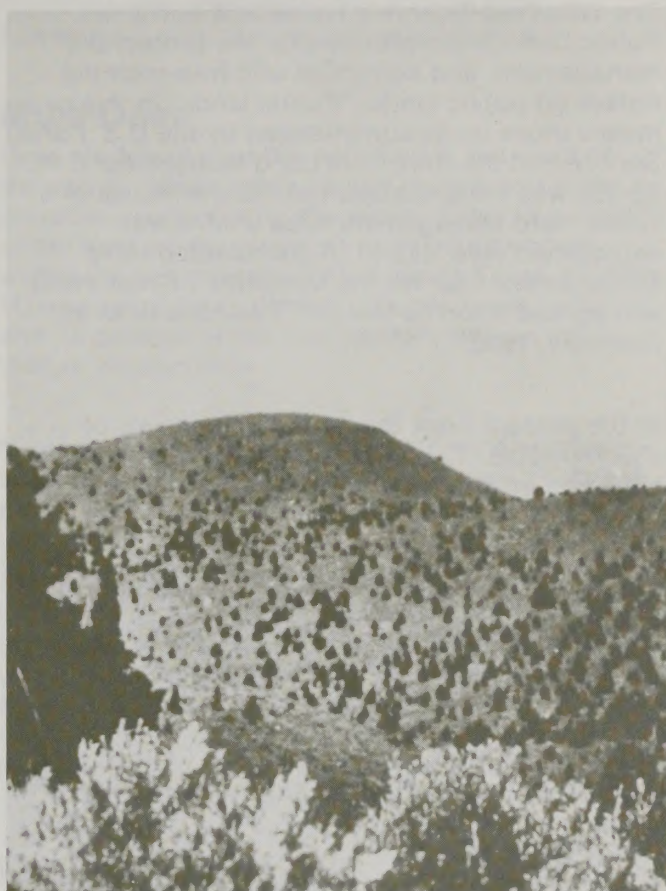


JUNIPER ESTABLISHMENT

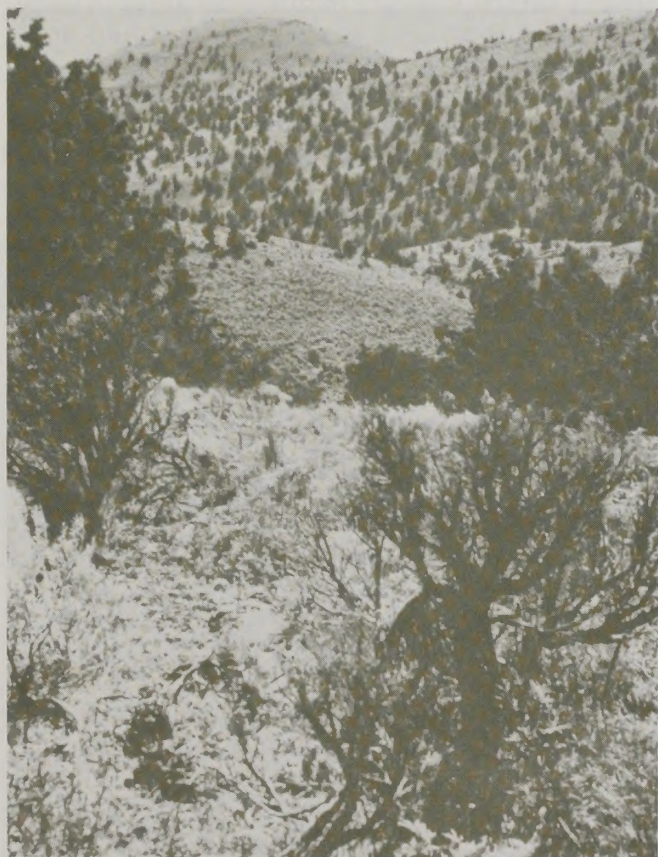
Windy Point Allotment #4007



1920



1945



1965



1956

Wild Horses

The Wild Free-Roaming Horse and Burro Act, Public Law 92-195 provides for the protection, management, and control of wild free-roaming horses on public lands. "Public lands" in this case means those lands administered by the U.S. Forest Service and the Bureau of Land Management. PL 92-195 was the basis upon which the Murderer's Creek Herd Management Area (HMA) was established (see Map 3). A coordinated Herd Management Plan for the Murderer's Creek Herd was agreed upon by the USFS and the BLM in February, 1975.

At the present time, the herd area consists of 143,140 acres. This area is comprised of federal, state and privately owned lands. (See Table 3-7.)

Table 3-7 Land Status Within the Murderer's Creek HMA

	Acres
U.S. Forest Service	73,600
Bureau of Land Management	34,200
Oregon Wildlife Commission	7,900
State Land Board	40
Private	27,400
Total	143,140

The Murderer's Creek Herd utilizes USFS lands approximately 80 percent of the time and BLM, state and private lands approximately 20 percent of the time.

According to the Murderer's Creek Herd Management Plan the herd will be maintained near 100 head. In 1970, the herd inventory was 97 animals and currently there are 102. Poor physical condition of wild horses gathered in February, 1982, indicates that 100 horses for the herd is an optimum number during hard winters. While a population study has not been done on the herd, the annual increase is thought to be approximately 20 percent. There is concern that horse quality in the herd is poor due to line breeding and inbreeding.

The Murderer's Creek herd area is topographically, a rough use area for horses. Elevations range from 2500 to 6650 feet. Topography at the low elevations is extremely rugged, with numerous canyons, high rimrock and slopes ranging from 60 to 100 percent. Flat benches, tables, and ridges are found between

canyons throughout the area. Upper elevations are not as steep and have slopes which are primarily forested but have some intermingled patches of low sagebrush and open meadows. Slopes usually do not exceed 60 percent in the higher elevations.

Water in the Murderer's Creek HMA is plentiful. Several reservoirs exist along with perennial streams.

Wildlife

The habitat or populations of animals which would be impacted by the alternatives are discussed below (see Map 8). Data for mule deer, pronghorn antelope, Rocky Mountain elk and California bighorn sheep are summarized in Table 3-8. Mountain lion, bobcat, and coyote are not discussed because their habitat and populations are not expected to change significantly as a result of the alternatives. Riparian and fisheries habitat inventories and site specific discussions of fish and wildlife are available at the Burns District Office.

Habitat Diversity

Habitat diversity can be correlated with the range condition and successional stages of forest types described in the vegetation section. Generally, vegetation communities in mid-seral stage have greater habitat diversity than similar areas in early seral stage. Riparian areas with trees, shrubs and herbaceous species provide greater habitat diversity than areas with only one of these components. In general, the greatest numbers and kinds of wildlife are found in areas with the greatest habitat diversity. Two key habitats are absent or scarce on public lands, a climax riparian community (referred to as Excellent Condition in Table 3-9) and mature, old growth forest that is rapidly becoming depleted on public lands. The diversity of forest types is discussed later in relation to those animals affected.

Table 3-8 Summary of Big Game on Public Lands in the RMP Area.

Animals or Animal Groups	Habitat	Public Acres
Mule Deer	Winter Range	93,193
	Summer Range	88,927
Pronghorn Antelope	Winter Range	2,760
	Summer Range	15,830
Rocky Mountain elk	Winter Range	20,270
	Summer Range	23,980
California Bighorn Sheep	Yearlong Range	5,240

Threatened and Endangered Animals

The bald eagle is classified as threatened in Oregon under the Endangered Species Act of 1973. Bald eagles winter in the area, mostly along the South Fork and the North Fork of the John Day River. Populations on public lands are usually less than ten bald eagles. Bald eagles roost in mature conifers near Rudio Canyon, along the South Fork and adjacent to Rattlesnake Creek. Peregrine falcons migrate through the area.

Riparian Habitat

In the RMP area, the water and water-associated vegetation located in riparian areas are very important to wildlife as sources of food and cover. Of 378 terrestrial species known to occur in the Blue Mountains, 285 are either dependent on the riparian zone or use it more than other habitats (USDA 1979). Biologists found this area to be the most important wildlife habitat in the Blue Mountains.

Streamside riparian habitat consists of the linear strips of vegetation along streams. About 484 acres along 76 stream miles occur on public lands in the RMP area. Appendix H describes the methodologies for wildlife habitat condition ratings in riparian areas. Table 3-9 summarizes the condition of habitat along streams. Important riparian shrubs and trees are water birch, red-osier dogwood, coyote willow, peachleaf willow, Pacific willow, thin leaf alder and black cottonwood.

Upland meadows have not been quantified in acres nor mapped. Consequently, these areas are not included in the riparian data.

Table 3-9 Summary of Riparian Habitat Condition By Allotment Category

Category I Allotments

Condition	Stream Miles	% of Total Riparian Stream Miles
Excellent	0.0	0.0
Good	4.9	6.0
Fair	7.2	10.0
Poor	16.4	22.0

Category M and C Allotments

Condition	Stream Miles	% of Total Riparian Stream Miles
Excellent	0.0	0.0
Good	12.4	16.0
Fair	17.3	23.0
Poor	17.8	23.0

Big Game

Grant County often leads the state in total numbers of deer and elk harvested annually.

Mule Deer

Deer are found over the entire area, but most of the use on public lands occurs on low and mid-elevation range during the winter. Over 79 percent of the deer winter range on public land occurs within the Northside and Murderer's Creek Wildlife Management Units (WMUs). Public lands cover 12 and 13 percent of the deer winter range in these WMUs, respectively.

Winter snow forces deer out of higher elevation summer range onto winter range. Cover on winter range is provided by western juniper, curleaf (mountain) mahogany and rough topography.

Food and cover provided by winter habitat are especially important because the deer's fat reserves decrease during the winter. Winter ranges are the first areas to have both annual and perennial green grasses and forbs in the spring providing forage needed by deer to improve their weakened condition.

Pronghorn Antelope

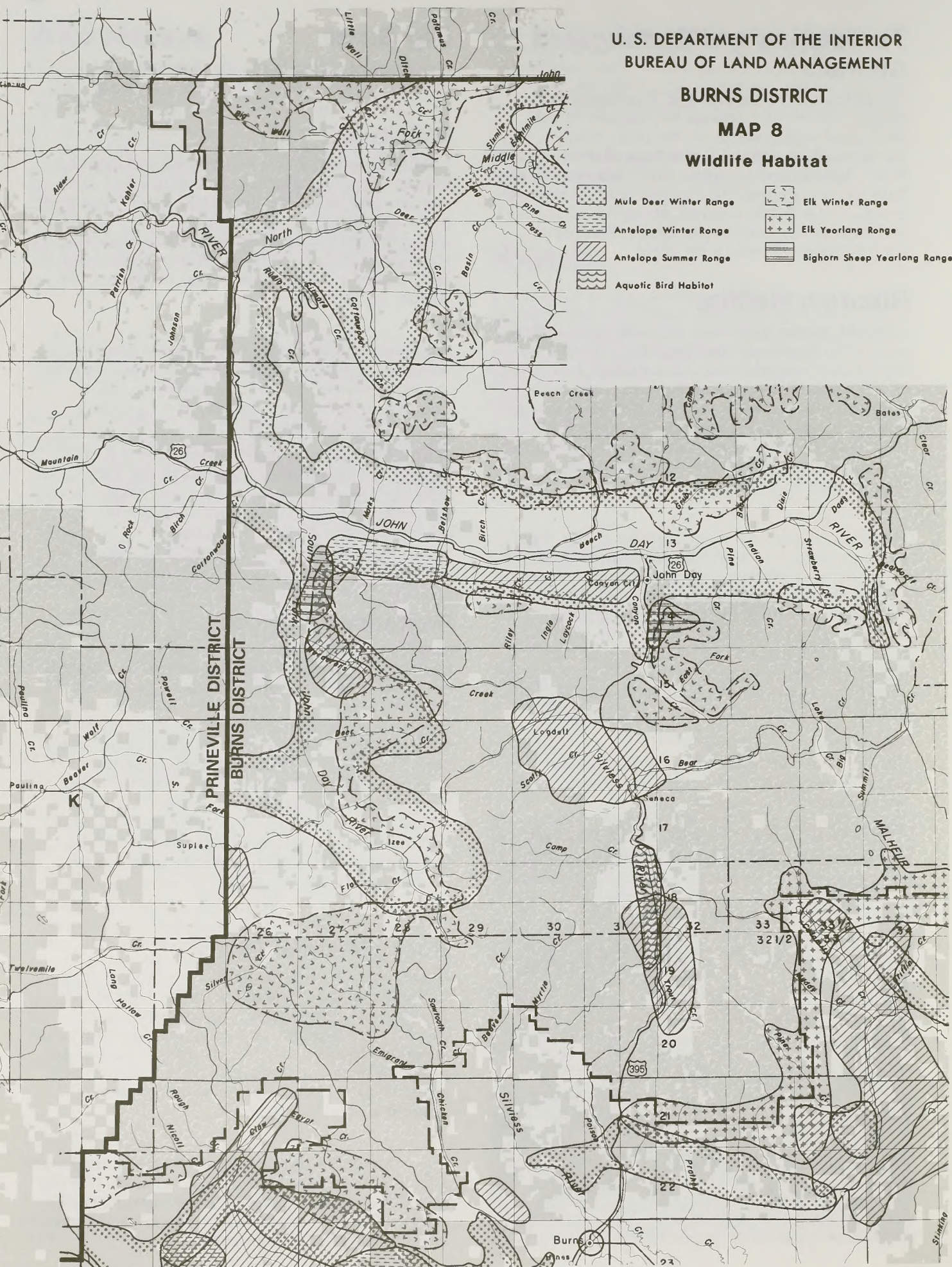
Antelope range over about 10 percent of the public lands. Sagebrush and grassland/forb habitats are dominant vegetation on antelope range. Most of the RMP area is poorly suited for antelope due to rough topography and a cover of junipers and other conifers over much of the area. South of the John Day River and near Murderer's Creek, antelope herds first appeared in 1969-1971 and have increased markedly in numbers. ODF&W estimates the John Day River herd at 140 animals and the Murderer's Creek herd at 100 animals. Other antelope habitat in the RMP area has few animals or little public land.

Rocky Mountain Elk

Small herds of elk use summer and winter range on public lands. Shifts in elk use can occur from year to year, often in response to cattle use of forage and timber harvest activities. Thermal cover is needed by elk yearlong. Elk use the cool shade provided by dense trees during the summer and reduce heat loss during cold winter nights by seeking adequate tree cover.

Public lands are significant for elk, since adjacent private property may leave no suitable elk thermal and hiding cover following timber harvest. Until regeneration provides suitable elk cover, elk may make little use of these areas.

Wildlife Habitat





Bighorn Sheep

Twenty-six California bighorn sheep were introduced into the Strawberry Mountains in 1971 and fourteen were introduced into the Aldrich Mountain area in 1978 by Oregon Department of Fish and Wildlife. ODF&W estimates the Strawberry Mountain sheep herd at fifteen and the Aldrich Mountain herd at forty. Considerable use of public lands by bighorns occurs at both locations.

Upland Game Birds

Valley quail are found along brushy drainages and on adjacent uplands. Chukar partridge prefer steep, rocky terrain adjacent to drainages. Both species are relatively abundant on the open rangelands found along the John Day River and its tributaries. Hungarian partridge are occasionally observed in habitat used by valley quail and Chukar.

Blue grouse and ruffed grouse occupy the timbered parts of the RMP area. Blue grouse are found in heavily timbered, old growth areas, and on the edges. Ruffed grouse are usually found in brushy timbered areas, often cut over, and near brushy riparian habitat.

Mourning dove are spring through fall breeding residents found throughout the RMP area. Nesting occurs in both trees and on the ground.

Mountain quail and pheasants are infrequently observed on public land. Sage grouse are rarely observed.

Water Associated Birds

Approximately 70 species of birds use the Silvies Valley during spring migration. Thousands of dabbling ducks, geese, shorebirds, and other water associated birds use the flooded portions of the valley at that time. Approximately 900 acres of public land are flooded during average spring runoff. Some representative species are Canada goose, mallard, pintail, pied-billed grebe, long-billed curlew, Wilson's phalarope, willet, greater sandhill crane, and California gull.

As water recedes bird use is reduced. By midsummer little of Silvies Valley is flooded and little of the public land is habitat for water dependent birds. One 30-acre reservoir in Silvies Valley, approximately 50 percent on public land, serves as valuable brood water and is used by fall migrants. Nesting cover is often inadequate for waterfowl due to livestock grazing and/or low site potential.

Rivers and streams in the area also provide limited habitat for water dependent birds. Mallards, common mergansers, cinnamon teal, and Canada geese nest along these streams, but production is low on public lands due to steep gradients and small pools and inadequate nesting cover.

Other Wildlife Species

The Blue Mountains provide habitat for 378 species of wildlife (USDA 1979). Ninety-one percent of these species inhabiting public land are nongame species. Some of these animals are inhabitants of the open, low elevation rangelands while others are dependent upon old growth conifer trees for their survival. Some species are primarily found in a transition zone between the rangeland and forested areas. Some species, such as deer mice, are found in every plant community while others, such as pilated woodpeckers, confine their activities to forested sites having mostly large, old age trees.

Inventory of riparian habitat on public lands in 1980 and 1981 found these areas in relatively poor condition with only 100 acres out of 484 acres in good condition, or 21 percent. Seventy-nine percent was in poor or fair condition.

Fish

Historically, the John Day River Basin was a major spawning ground for anadromous fish species including summer steelhead and spring chinook salmon (see Map 9). Habitat degradation and other factors have reduced the production of these areas to a fraction of their former levels.

Other native species found in the John Day Basin include redband trout (an undescribed species), rainbow trout, Dolly Varden (Bull trout), mountain whitefish, mottled sculpin, Piute sculpin, shorthead sculpin, redbside shiner, long nose dace, speckled dace, chiselmouth, northern squawfish, largescale sucker, bridgelip sucker, mountain sucker and both the Pacific and Pacific brook lampreys. Species introduced into the John Day Basin include hatchery reared rainbow trout, brook trout, Yellowstone cutthroat trout, smallmouth bass, channel catfish, black bullhead, brown bullhead and carp. Table H-1 in Appendix H displays the species by the stream they occur in.

Habitat quality ratings for each stream were made during the 1981 field season. (See Appendix H.) Of the approximately 61 miles of fish habitat in the John Day Basin, about 21 miles were rated as poor, 36 miles as fair, only 3.5 miles as good and none as excellent. The population trends for species present are shown in Table H-2.

Anadromous species exhibit a downward trend while the other species are stable. Populations of carp, squawfish, suckers and other undesirable species are stable largely through the efforts of the ODF&W and their rotenone program on streams exhibiting problems. The two species showing an upward trend, smallmouth bass and channel catfish are the result of a vigorous stocking program by ODF&W. Other species, such as the trouts, could be described as "holding their own". Table H-3 summarizes population data for three streams in the John Day Basin, Deer Creek, Murderer's Creek and Cottonwood Creek (near Dayville). Numbers of fish per mile ranged from approximately 3,500 to 5,500. Other streams such as Flat Creek (tributary to South Fork John Day River) are so severely degraded as to support populations of only a few hundred fish per mile. Several such as Frank's Creek have entirely lost their carrying capacity for any fish species. Additionally, Deer Creek, Murderer's Creek and Cottonwood Creek are all summer steelhead spawning streams, thus supporting a higher population than those streams having a resident population only. This is due to the summer steelhead smolts out-migrating usually by age three, thus reducing the number of adult fish the stream must support.

Table H-4 summarizes data on summer steelhead spawning activity. Numbers of redds/mile vary from 0 to 10.0 dependent on spawning year and stream. While turbidity values in Table H-5 (Appendix H) indicate clean streams, spring snow melt and storm events increase sediment loads well above limits healthy to fish populations. Excessive water temperatures in many reaches lacking sufficient pool depth/area and/or riparian cover compound the problem. The highest temperature reflected in Table H-5 is 22.5°C (72.5°F). This temperature is exceeded by several degrees during late summer low flow periods in stream reaches having the problems discussed above. Sediments have accumulated, filling in pools and spawning gravels, thus reducing spawning and rearing capacities of the streams.





Work is progressing to alleviate many fisheries problems in the John Day Basin. A cooperative plan for salmon and steelhead habitat improvement in the John Day Basin has been prepared by the Confederated Tribes of the Umatilla Indian Reservation with assistance from Oregon Department of Fish and Wildlife, U.S. Forest Service, Bureau of Land Management, Confederated Tribes of the Warm Springs Indians, Columbia River Inter-Tribal Fish Commission, National Marine Fisheries Service, U.S. Fish and Wildlife Service and U.S. Bureau of Reclamation. Improvements to approximately 60 miles of stream administered by the Burns District is included in

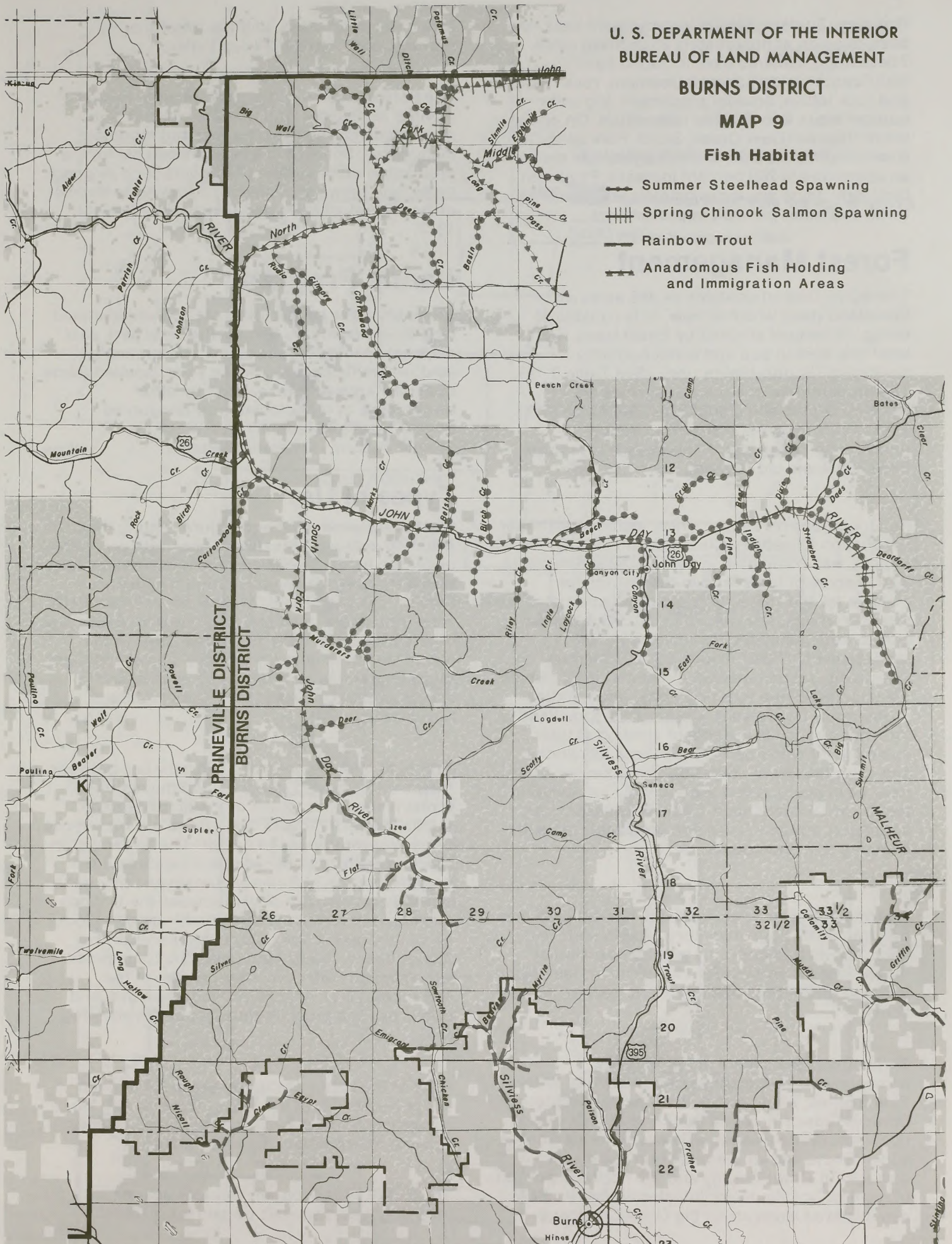
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BUREAU OF LAND MANAGEMENT

BURNS DISTRICT

MAP 9

Fish Habitat

-  Summer Steelhead Spawning
-  Spring Chinook Salmon Spawning
-  Rainbow Trout
-  Anadromous Fish Holding and Immigration Areas



that plan. To date, habitat improvement work has been done on approximately 25 of these miles. These improvements have included bank stabilization using juniper placement, rock riprap and rock jetties, boulder placement, log and boulder weirs and channel restoration. On one of these streams (Deer Creek, South Fork John Day River) rearing capacity after one year has shown an approximate 200 percent increase. Projected long term gains are approximately 300 percent for these and other planned improvements.

Forest Management

The Burns District contains 44,465 acres of forestland (land which is now, or is capable of being, 10 percent stocked by forest trees, is at least one acre in size and is not currently developed for non-timber use). (See Table 3-10). The predominant commercial species are ponderosa pine and Douglas fir (see Table 3-11). Stands vary in age and size from young reproduction (less than 11 years old) to mature trees 200 years old or more.

An Operations Inventory, which included a Timber Production Capability Classification (TPCC) system, was completed in 1983. It determined that 34,070 acres of forestland in the district are suitable for the sustained yield production of forest products. The remaining 10,395 acres are considered unsuitable for sustained yield management. These include noncommercial forestland and commercial forestland (CFL) which are unsuitable due to topography, reforestation problems or fragile soils. Commercial forestland is forestland which is capable of yielding at least 20 cubic feet of wood per acre per year. Locations and classification of these kinds of forested lands have been mapped and are available for review in the Burns District Office. Table 3-12 shows total forestland, suitable lands and unsuitable lands by planning unit and county.

An estimated sustainable, annual harvest level was determined through inventory growth and yield data. The district currently provides an annual timber sale program of 3.4 million board feet which is based on the previous forestland base of 48,818 acres.

Three forest pests are a factor in forest management. These are the Mountain and Western Pine Beetles, which attack the pine; the Western Spruce Budworm, which threatens stands of firs (Douglas, grand and white). Recent Forest Service surveys have shown the budworm to be active throughout Grant County and the northern portion of Harney County. Major infested stands on BLM administered lands are in the Dixie Creek and

Miller Mountain areas, and the infestation is moving south into the Silvies Valley.

The RMP area also contains an undetermined number of acres of land that are stocked with noncommercial species (juniper and mountain mahogany). Some of this land is available for the production of minor forest products such as posts, poles, and firewood. Table 3-13 shows the number of small product sales and timber volume since 1977.

Lands Program

There are a few large blocks of BLM administered land in Grant County but, for the most part, past disposal policies have resulted in intermingled landownership patterns. Many small isolated tracts of public lands are surrounded by other ownerships. In other locations intermingled private, state and federal tracts make up "checkerboard" ownership patterns.

Types of Use

Most of the producing agricultural land in the planning area was transferred to private ownership under the homestead laws, and most forested land was withdrawn for administration by the Forest Service, although the BLM does administer 44,465 acres (the figure used previously was 48,818 acres) of forestland within the RMP area. Most of the public land in the county consists of isolated, hard to manage tracts surrounded by private land and/or situated adjacent to or within national forest lands.



The BLM administered land typically lies between the privately owned lowlands and the national forest timberlands. Much of the timberland on public land is in fingers that extend out from those larger concentrations of timber. The larger, better blocked areas of public land are located on the western portion of Rudio Mountain and along the South Fork John Day River between the Ochoco and Malheur National Forests, with smaller blocks on Dixie Creek, Little Canyon Mountain and in Silvies Valley. Public land pattern is fragmented which inhibits effective management of the resources. Legal access for timber removal and public use is a problem throughout the planning area.

Most of the public lands are leased for grazing under Section 15 of the Taylor Grazing Act. Hay and grain are produced on river valley lowlands suitable for irrigation.

The BLM Lands Program includes actions involving land disposals by sale for residential,

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MAP 10

Existing Commercial Forest Lands

-  Commercial Forest Base acreage as of 1974
-  IZEE Timber Management Units

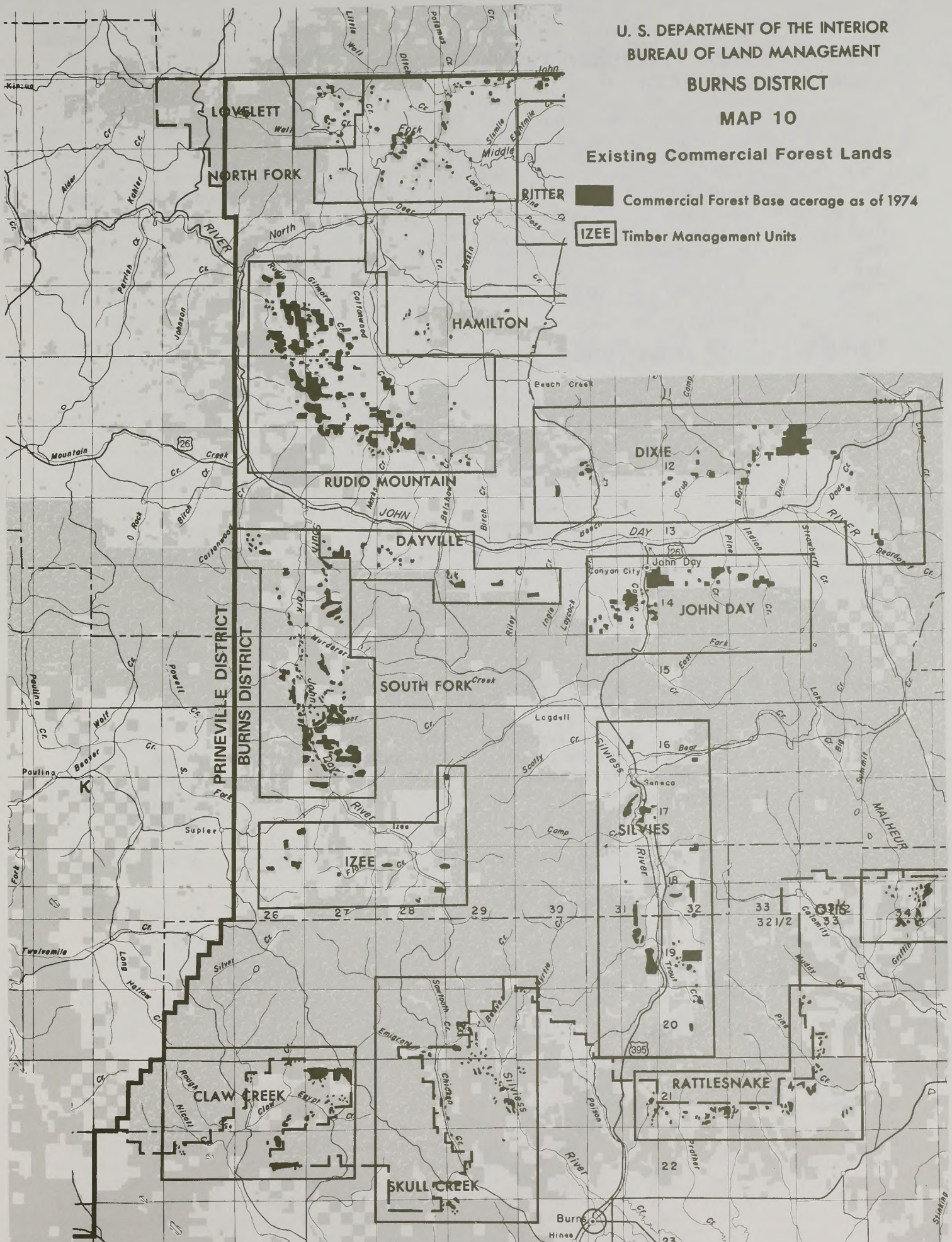


Table 3-10 Total Forestland Timber Production Capability Classification (TPCC)

	Non Commerical	Non Problem	Fragile Problem Site	Reforestation Problem Site	Adverse Location	Total TPCC Forest- land
John Day	4,649	9,636	14,554	4,143	2,898	35,880
Drewsey	1,035	928	1,662	398	120	4,143
Riley	1,419	251	2,371	370	31	4,442
District Totals	7,103	10,815	18,587	4,911	3,049	44,465

Table 3-11 RMP Area Timber Species

	Common Name	Scientific Name
Commercial Species	Ponderosa pine	Pinus ponderosa
	Douglas fir	Pseudotsuga menziesii
	Grand fir	Abies grandis
	Lodgepole pine	Pinus contorta
	Western larch	Larix occidentalis
	Engelmann spruce	Picea engelmannii
	Western white pine	Pinus monticola
Non Commercial Species	Western juniper	Juniperus occidentalis
	Mountain mahogany	Cercocarpus ledifolius
	Quaking aspen	Populus tremuloides

Table 3-12 Forestland by Planning Unit and County

Planning Unit	Total Forestland Acres	Acres Unsuitable For Sustained Yield Management	Acres Suitable For Sustained Yield Management	County Name	County Acres	County Percent
John Day	35,880	7,541	28,339	Grant	27,260	80.0
				Harney	1,079	3.2
Drewsey	4,143	1,195	2,948	Harney	2,948	8.6
Riley	4,442	1,659	2,783	Harney	2,783	8.2
				Grant	27,260	80.0
District Totals	44,465	10,395	34,070	Harney	6,810	20.0

Table 3-13 Forest Product Sales, 1977 - 1983

Product Units	1977	1978	1979	1980	1981	1982	1983
Saw Timber (Mbf)	3,935	3	6,556	312	4,319	48	4,341
Posts	1,190	1,976	850	5,685	3,111	4,156	1,300
Poles	0	0	0	350	150	1,430	504
Firewood (Cords)							
Sold	27	46	29	107	91	143	180
Free Use	0	0	0	155	219	745	205

commercial, industrial and agricultural development or community expansion; opportunities for rights-of-way including multiple-use and single-use utility/transportation corridors, communication sites, roads, landownership exchanges; plus land use authorizations to allow use occupancy and development of public lands.

Land Use Authorizations

The most common land use authorizations are rights-of-way for roads, highways, telephone lines, electric transmission and distribution lines, reservoir sites, pipelines and hydroelectric projects. Another major type of authorization involves lease or patent (title transfer) of sites for Recreation and Public Purposes (R&PP). There are also leases, easements, and patents of lands for Airport Purposes (primarily made under the authorization of the Airport and Airway Improvement Act of 1980).

Utility and/or Transportation Corridors

The following listed major routes have been identified and designated as utility/transportation corridors (widths vary but are a minimum of 2,000 feet):

- U.S. 395 from Burns to Umatilla County line
- U.S. 25 from Dayville to the Wheeler County line
- State Highway 402 from Long Creek to Monument to Kimberly
- State Highway 19 from Kimberly to U.S. Highway 26

Disposal Actions

Land exchanges with state and local governments and private parties occur when these exchanges are considered to be in the public interest.

Recreation

The only developed recreation sites on public land in the RMP area are the Lone Pine and Big Bend campgrounds. Due to lack of funding, these sites are no longer maintained by the Bureau. Numerous primitive sites are scattered throughout the area and offer opportunities for camping and picnicking.

A number of areas offer opportunities for scenic, geologic, botanic, zoologic, archaeologic, historic and/or cultural sightseeing use. Examples of high quality sightseeing opportunities on public lands include the North Fork of the John Day River above Monument, the South Fork of the John Day River below Dayville, the main stem of the John

Day River between Picture Gorge and Kimberly and the Silvies Valley.

Hunting is a major recreational activity and opportunities exist for hunting big game, upland game, waterfowl and other species. Deer and elk hunting is scattered throughout the area with the majority of these activities taking place on land administered by the Forest Service. Most of the antelope hunting occurs in Bear Valley, the foothills between John Day and Dayville, and in the Murderer's Creek area.

There are excellent populations of valley quail throughout the main John Day Valley but most of the hunting is on private land. Chukar hunting is as popular as quail hunting and Bureau administered lands receive the majority of the use for this activity. The best areas for chukar hunting are Murderer's Creek and the rocky hillsides below Dayville. Some chukar hunting also occurs between Monument and Kimberly along the North Fork of the John Day River and its tributaries.

One stream, the North Fork of the John Day River, is suitable for rafting. The season is short, usually May through mid-June, so the quantity of the activity is limited. The area of use is between Dale and Monument, with some people also rafting the quiet stretch between Monument and Kimberly. The high quality scenery of the upper portion with its high bluffs, foothills, and scattered stands of ponderosa pine enhances the floatboating activity. This stretch has been listed in the Nationwide Rivers Inventory completed by the Heritage Conservation and Recreation Service (now part of the National Park Service) in 1982. It has the potential for eligibility as a scenic river area under the Wild and Scenic Rivers Act's classification criteria.

Fishing opportunities are available on Bureau administered lands for cold and warm water species in streams only. No reservoirs are used for recreational fishing. The major fisheries are the Main Fork, North Fork and South Fork of the John Day River. The John Day River is considered to be one of the last streams in the United States providing angling for "wild" steelhead trout.

Table 3-14 shows the estimated current recreational visitor use for the RMP area. Of the total visitor use in Grant County, about five percent occurs on BLM land.

Table 3-14 Estimated Recreational Visitation

Recreational Activity	1982 Visitation	
	Visitor Days/Year	Public Lands Within the RMP Area
Hunting		
Big Game	249,300	9,800
Small Game	4,000	350
Waterfowl	2,500	150
Upland Game	7,400	3,200
Fishing	27,700	4,200
Camping	203,800	10,200
Other Day Use	229,100	8,300
Total	723,800	36,200

*Total area day use visitation excludes urban and semi-urban activities not generally associated with lands administered by the BLM.

The Bureau of Land Management is required to identify, evaluate, and protect prehistoric and historic resources on public lands under its jurisdiction; to insure that Bureau initiated or Bureau authorized actions do not inadvertently harm or destroy federal and non-federal cultural resources. These requirements are mandated by Congressional Acts and Executive Orders.

Because of size of the public land base in the John Day RMP Area, approximately (190,800 public acres), a comprehensive survey to identify all historic and prehistoric properties that might be eligible for inclusion in the National Register of Historic Places is impossible. However, the BLM has completed an existing data (Class I) inventory of the area (Toepel et al. 1979), wherein no properties on public land are presently included on the National Register, while two properties appear to meet National Register eligibility criteria. Furthermore, a field sample (Class II) inventory is being conducted this year in the John Day Planning Area.

More information about these inventories can be obtained upon request from the Burns District Office. However, specific site information on archaeological sites is confidential and will not be made available to the general public. The inventories are conducted in accordance with the Programmatic Memorandum of Agreement between BLM and the Advisory Council on Historic Places, dated January 14, 1980.

Archaeology

In the John Day Planning Area approximately 5000+ acres (2.6 percent of public acreage in the area) have been intensively inventoried for archaeological values, on a project specific basis. Forty-six prehistoric and 17 historic sites are documented to be on public lands. Two prehistoric sites are considered eligible for the National Register of Historic Places (NRHP). Seventeen sites (14 prehistoric/3 historic) are potentially eligible for the National Register, while 44 sites (30 prehistoric/14 historic) are probably not eligible.

The potential for encountering additional prehistoric and historic archaeological sites is fairly high throughout the planning area (Toepel et al. 1979). Existing information does not allow reliable estimates to be made regarding the quantity and/or the nature of sites that may be on public domain in the subject area. However, significant sites are likely to occur.

The prehistory of the general region began at least 10,000 years ago, and is characterized by

Visual Resources

Visual resources are the land, water, vegetation, animals and the other features (as described in this chapter) that are visible on public lands and comprise the scenic quality of the area. Visual Resource Management (VRM) objectives have been developed based on an inventory and evaluation of scenic quality, visual sensitivity and distance zone. (See Glossary.) Examples of highly scenic and sensitive areas on public lands include portions of several forks of the John Day River.

VRM classes specify management objectives and allow for differing degrees of modification. Class I provides the highest level of protection for scenic values, and Class IV the lowest level. Public lands in the RMP area are classed as VRM Class II (15 percent), Class III (9 percent) and Class IV (46 percent). Objectives for each VRM class are listed in the Glossary.

VRM inventory data for the John Day RMP area are available in the Burns District Office.

Cultural Resources

Cultural resources are fragile and nonrenewable elements of the environment, which include sites, buildings, structures, objects, or districts that are associated with or representative of people, cultures, or human activities and events; they may be of prehistoric, historic, or contemporary cultural periods.

influences from the Columbia Plateau and the Great Basin sub-areas. Limited field work has been performed in the planning area, such that the regional prehistory is not yet completely understood. Archaeological sites located on public lands in the John Day Planning Area may provide invaluable scientific data in a part of the state that remains relatively unstudied (Cressman 1950; Toepel et al. 1979). Aboriginal/prehistoric site types known to occur on public lands include lithic scatters, quarries, rock shelters and stone structures. Additionally, camp sites, rock art, house features, trails and burial sites occur in the area and are expected to exist on BLM lands as well.

Historic period features are diverse in this region. Historic sites known to occur on public lands include mining-related features, trash dumps, cabins, cemeteries, and ranching-related features. Historic roads, railroad grades, logging-related features, townsites and post offices are also found in the area, and are expected to occur on BLM lands (Toepel et al. 1979).

Site conditions range widely from completely destroyed to nearly pristine, with most sites in poor to fair condition. In this planning area, conflicts have come from livestock grazing, construction of roads and other facilities, unauthorized specimen collection, timber management practices, minerals extraction, natural weathering, erosion and fire.

Native American Values

The Planning Area was utilized during ethnographic and post-contact times by the Northern Paiute, the Umatilla, Warm Springs, Cayuse, Nez Perce and Walla Walla Indian groups as well. The region attracted seasonal fishing, hunting and root gathering at localities along major watercourses and in the mountain valleys along the upper reaches of watercourses (Couture 1984; Toepel et al. 1979).

Geology and Mineral Resources

The geology of the John Day Planning Area is extremely varied. Igneous, metamorphic and sedimentary rocks are all present. Ages for the rocks range from more than 250 million years (late Paleozoic) to less than 10,000 years (very recent).

Between 200 and 250 million years ago, igneous rocks from the ancient ocean floor were uplifted through the pre-existing marine deposits to form Canyon Mountain, near John Day, Oregon. These

rocks locally contained masses of chromium ore. In places the rocks were extensively deformed, creating local deposits of chrysotile asbestos.

Most of the planning area lies in the western Blue Mountain region, where a thick sequence of Mesozoic-Paleozoic marine sedimentary rocks is largely covered by younger volcanic rocks. Where exposed, the marine rocks are tightly folded and partially metamorphosed. There has been increasing interest in oil and gas exploration in this area in recent years. The forces that created this area subjected the rocks to favorable conditions for petroleum formation and may have developed structures capable of trapping oil and natural gas. Most of the exploration is currently in the western half of the planning area.

Cretaceous intrusive rocks and associated veins form the other major geologic features from an economic stand point. Vein systems occur throughout most of the Blue Mountain region, while the principal intrusive occurrences are exposed at Dixie Butte (Quartzburg Mining District), Canyon Mountain (Canyon Mining District), and in portions of the Aldrich Mountains. The Idol City Mining District is associated with an isolated vein system in the southcentral portion of the planning area. Metals associated with the intrusives are gold, silver, copper and cobalt and other metals in lesser amounts.

Leasable Minerals

Oil and Gas

The federal government administers oil and gas rights beneath approximately 360,120 acres in the planning area. Most of the western half of the planning area has been leased for oil and gas, and approximately four exploration permit applications are reviewed annually. Exploration efforts have been associated with a general increase in activity in eastern Oregon which occurred after discoveries of noncommercial quantities of gas in eastern Washington.

Geothermal

The central (interior) third of the planning area is classified as prospectively valuable for geothermal resources, and several hot springs occur throughout the planning area. There are no leases or lease applications. Based on present information, it appears that any geothermal resources which may occur would be low to moderate in temperature and more suited to direct use (e.g. heating) applications, rather than for electrical power generation.

Locatable Minerals

Locatable minerals in the planning area include gold, silver, copper, cobalt, chromium, asbestos, limestone, diatomite, zeolites and possibly molybdenum.

Specific areas of interest include the Canyon Mining District at Canyon City-John Day, Oregon vicinity for placer gold deposits and lode deposits of gold, silver, and copper; the Quartzburg Mining District, north of Prairie City, Oregon for placer gold deposits and lode deposits of gold, silver, copper, cobalt and molybdenum. There are numerous small lode and placer operations throughout both of these districts. Also, there has been continuing exploration and development work on small chromium deposits along the north face of the Strawberry Mountains and in the Aldrich Mountain vicinity.

Asbestos, limestone and diatomite have small localized occurrences, while zeolites are fairly widespread in the planning area. However, there are no mining claims nor any exploration interest in these minerals. Generally, these deposits have limited quantities and/or poor quality material.

Salable Minerals

Salable materials include common variety rock, sand and gravel, fill and riprap material. Operations on federal lands include one community pit south of Dayville, one material site on the North Fork of the John Day River operated under free use by Grant County and four free use material sites operated by the State of Oregon. There is a need for sand, gravel and clay in the vicinity of John Day, Oregon. However, there are mining claims on most suitable deposits which preclude BLM authorization of material removal from these sites.

Paleontological Resources

Fossils are known to occur in several geologic formations within the planning area. These formations have been classified to indicate the likelihood of significant fossil occurrence (significant fossils are considered to be vertebrate fossils of scientific interest) vulnerable to surface-disturbing activities.

These locations within the planning area consist of Tertiary deposits lying in the northwest corner of Grant County in the vicinity of the Monument-Kimberly-Picture Gorge-Mt. Vernon vicinity. The tertiary deposits of the Eocene Clarno Formation, the Oligocene John Day Formation and the late Miocene Mascall Formation have yielded thousands of plant and vertebrate fossils. This area

includes the John Day Fossil Bed National Monument and numerous additional finds are reported on other public and private lands in the vicinity. Geologic information suggests that fossil concentration may exist on an extensive area of public lands in this area.

Economic Conditions

The major portion of the John Day Resource Management Plan Area is in Grant County with a small portion in northern Harney County. For purposes of analyzing economic consequences resulting from the proposed alternatives, Grant County will be considered the zone of influence.

Population and Income

Grant County had a population of 8,210 in 1980. More than 60 percent of the county's population live in the John Day area. Table 3-15 displays the population fluctuations of the past three decades.

Total personal income in 1981 for Grant County was \$69,236,000. Per capita personal income for this county in 1981 was \$8,447 as compared with a statewide average of \$10,009 (U.S. Department of Commerce, Bureau of Economic Analysis 1983).

Table 3-16 presents wage and salary employment and income for Grant County. In 1981 there were 3,429 individuals employed in Grant County. The number of farm proprietors totaled 423, nonfarm proprietors totaled 453 and wage and salary employment totaled 2,553. Approximately 90 percent of local wage and salary employment is nonfarm, with 50 percent employed in private industry and 40 percent employed in federal, state, and local government. Lumber and wood products are the most important manufacturing industry in Grant County, and directly accounts for 14 percent of the nonagricultural employment (Oregon Department of Human Resources 1983).

Table 3-15 Population for Grant County and the State of Oregon

	1960	1970	1980
Oregon	1,768,687	2,091,533	2,633,105
Grant County	7,726	6,996	8,210
Decadal Change	-7%	-9%	17%

Source: U.S. Department of Commerce, Bureau of the Census, 1981.

Table 3-16 Income and Employment by Source, Grant County, 1981

	Personal Income		Employment	
	(\$000)	%	No. of Jobs	%
Total	69,236	100	3,429*	100
Farm	4,378	6.3	607*	18
Non-Farm	64,858	93.7	2,822*	82
Agricultural Services	D	D	D	D
Mining	D	D	D	D
Construction	1,521	2.2	10	0**
Manufacturing	11,668	16.8	504	21
Transportation & Public Util	1,959	2.8	80	3
Wholesale Trade	536	0.8	10	0
Retail Trade	4,380	6.3	341	14
Finance, Insurance & Real Estate	884	1.3	60	3
Services	3,115	4.5	235	10
Government				
Federal, Civilian	7,349	10.6	396	17
Federal, Military	124	0.2	10	0
State & Local	7,266	10.5	598	25

Source: Regional Economic Information System, Bureau of Economic Analysis, 1983

D = Not Disclosed

* Consists of Wage and Salary Jobs (Full and Part-Time) plus number of proprietors.

** Percentages based on Total Wage and Salary Nonfarm Employment of 2,369.

of local personal income and employment attributed to the resources in Grant County were developed by using the USFS IMPLAN System (see Appendix I).

Dependence of Livestock Permittees on Public Forage

There are 157 grazing allotments and 142 livestock operators in the planning area. At present, there are 25,323 AUMs of active preference. Fifty percent of the grazing fees collected annually are distributed to the county in which they originated.

The dependence of ranch operations on BLM forage is determined by the amount of total required forage that public lands provide, the seasons when forage is available and the availability of substitutes for the forage. The allotments in the RMP area consist mainly of scattered parcels of BLM land intermixed with private land. Available data is generally inadequate to determine ranch dependence in cases where there is little public land in the allotment. An analysis of dependence on BLM forage has been made for the 12 operators with active preference in I category allotments. These are the only allotments which might be affected by potential BLM actions.

Economic Relationships

Minerals

Leasable minerals include oil and gas and geothermal resources. There are 114 oil and gas leases on 609,273 acres of BLM and Forest Service land in Grant County. The mineral leasing fee is \$1 per acre. There are no geothermal leases or lease applications for this planning unit, however, a portion has been classified as prospectively valuable. Locatable minerals include gold, silver, copper, cobalt, chromium, asbestos, limestone, diatomite, zeolites and possibly molybdenum. Salable minerals include rock, sand and gravel, fill and riprap material. There is no information on income, deposits, or production from these mining claims.

Timber

The John Day Planning Area timber resources cover 44,465 acres. The current planned harvest level is 3.4 million board feet (MMbf) per year. This harvest level amounts to less than one percent of the total annual harvest for Grant and Harney Counties. Four mills in Grant County receive the majority of the timber harvest from the area. Timber harvest over the last 5 years averaged 2.37 MMbf, which generated \$604,000 in local personal income and 24 jobs on an annual basis. Estimates

Table 3-17 presents the average dependence according to ranch size categories. The average ranch is about 18 percent dependent on BLM forage. This analysis is based on active use. For at least one month during the grazing season two ranches in the smallest ranch size category are 100 percent dependent on BLM land. Generally, the smaller ranches are more dependent on BLM grazing than are the larger ranches.

In a Grant County study by Bedell, Schmisser and Heintz (1982), the average ranch is about 3 percent dependent on BLM land. This is based on a sample size of 42 livestock operations for Grant County. Information gathered for this study suggests that federal grazing dependent ranches in Grant County are not highly diversified or involved in other farm products, however, the smaller operations have income from sources other than agriculture. The ranch operations with a herd size of less than 100 cows receive, on average, 30 percent of their income from agricultural sources and 70 percent from non-agricultural sources. Approximately 22 percent of their total income is from livestock sales, the remaining 8 percent is from other agricultural sources.

The BLM does not recognize the right of the

permittee to treat grazing permits as real property. However, effects on private asset valuation may occur. Based on BLM file data, it is estimated that an average value for BLM grazing permits is approximately \$55 to \$60 per AUM.

Recreation

Total expenditure in Grant County for recreation activities on public lands in 1982 were \$746,800. Hunting activities generated \$153,200 in local personal income and 8 jobs. Fishing generated \$46,000 in income and 2 jobs, and other recreational activities accounted for \$252,400 in income and 12 jobs.

Table 3-17 Permittee Dependence on BLM Forage by Herd Size Class¹

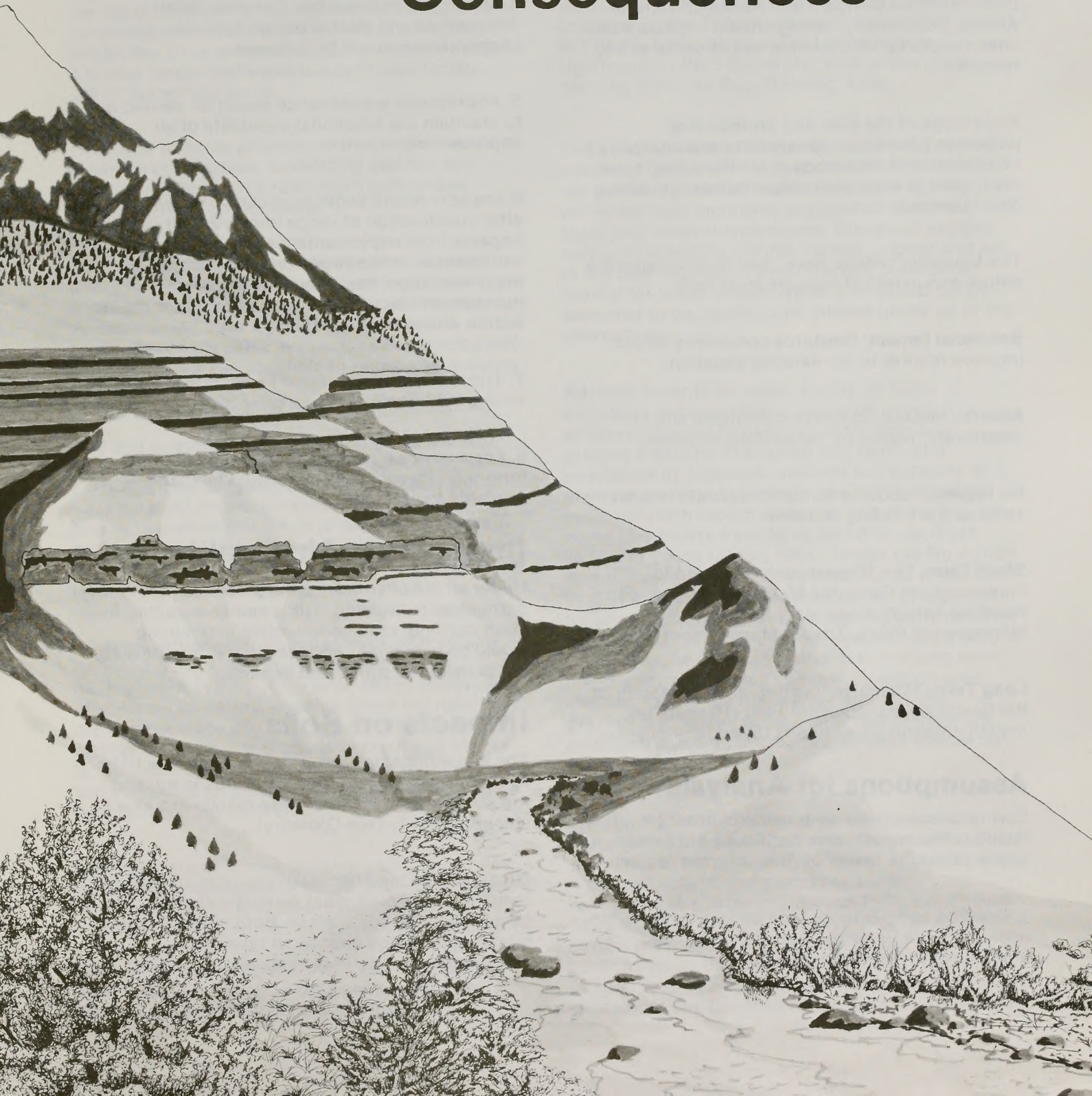
Herd Size Class	Number of Permittees In Class	Permittees by Level of Dependence ²				Average Dependence
		0-15%	16-30%	31-45%	46-80%	
0-399	9	3	2	3	1	21%
400-999	2	1	1	—	—	20%
Over 1,000	1	1	—	—	—	9%
Total	12	5	3	3	1	18%

¹ Data for I category allotments only.

² The dependence level is represented by the percentage of annual forage requirements supplied by public lands.

Chapter 4

Environmental Consequences



Introduction

This chapter describes the significant environmental consequences that would result from implementing each of the alternatives. These environmental consequences (impacts) are compared to the existing situation, as described in Chapter 3. If a resource is not affected or if the impacts are considered insignificant, no discussion is included. Analysis, including the scoping process, indicates that there would be no significant impact upon air quality, energy use, agriculture and areas of special designation (e.g. Wild and Scenic Rivers, Areas of Critical Environmental Concern and Research Natural Areas). Additionally, no significant impacts from land ownership adjustments would occur to any resource.

Knowledge of the area and professional judgement, based on observation and analysis of conditions and responses in similar areas, have been used to infer environmental impacts where data is limited.

The following criteria were used to determine the nature and extent of impacts identified:

Beneficial Impact: Resource conditions would improve relative to the existing situation.

Adverse Impact: Resource conditions would deteriorate relative to the existing situation.

No Impact: Resource conditions would remain the same as the existing situation.

Short Term: The 10-year period needed to implement the Resource Management Plan and resulting activity plans, e.g., Allotment Management Plans, Timber Management Plan, etc.

Long Term: Fifteen years after implementation of the Resource Management Plan (10 years for implementation plus fifteen (15) additional years).

Assumptions for Analysis

Several assumptions were made in order to facilitate the impact analysis. These are listed below to aid the reader in reviewing the impacts.

1. Funding and personnel will be sufficient to implement the Preferred Alternative or any alternative as described herein.

2. Significant impacts from grazing management under all alternatives are limited to the I category allotments. Because no change is expected from the existing situation except for maintenance on the M and C category allotments, these areas are not discussed further.

3. Monitoring studies and site specific activity plans would be completed and followed as indicated and adjustments or revisions made as needed.

4. Management Guidance Common to All Alternatives and related design features (Appendices) would be followed.

5. Appropriate maintenance would be carried out to maintain the functional capability of all improvements.

6. Impacts would begin to occur within one year after construction of range improvement projects. Impacts from implementation of grazing systems would occur in the short and long term. Until implementation, the impacts of grazing management would be the same as under the No Action Alternative.

7. Those impacts not stated as short term or long term would occur in the long term.

8. For analysis purposes, it is assumed that all long-term forage increases would be made available to livestock.

Impacts on Air Quality

Under all the alternatives, the presence of particulate matter and visible smoke resulting from slash burning, road construction and mining would be very minor and temporary, and thus are not considered significant impacts.

Impacts on Soils

The major impacts on soils in the John Day RMP Area are from soil compaction, landsliding, and top soil removal. Each of these results in a loss of soil productivity (see Glossary).

Grazing livestock affect soil resources mainly by removing protective plant materials and compacting the soil surface. Both of these actions tend to reduce soil infiltration rates and, concurrently, to increase surface runoff rates

(Leithead 1959; Rauzi and Hanson 1966). The result is greater surface soil losses during major precipitation events. Over the long term, surface soil loss and compaction reduce soil productivity and vegetative growth. Well-managed grazing of livestock can minimize the effect on soils (Council for Agricultural Science and Technology 1974). Grazing systems that incorporate deferment tend to cause less impact than annual, season-long use. Under the No Action Alternative, approximately 36,000 acres of pasture in the I category allotments would be designated for spring-summer grazing or spring-early rotation grazing (see Table C-2 in Appendix C). Since both systems allow only a brief period of deferment, this alternative would have a moderately adverse impact on soil productivity. Under the other three alternatives, grazing systems utilizing longer rest periods would beneficially affect the soil resource.

The major impacts of timber management on soils would be compaction, landsliding and top soil removal resulting from road construction and timber harvesting operations.

Soil compaction from yarding systems results primarily from the weight and shearing forces involved in yarding operations. Tractor logging systems would have a greater impact on soil productivity than cable systems, as compacted soil surfaces are very susceptible to rilling and gullyng (Brown 1978).

One end suspension (cable system) has a lesser impact than systems providing no suspension. Total suspension systems (aerial or cable) would have the least impact on soils. When compaction occurs, the attendant effect of reduced infiltration capacity has been found to persist at least 55 years in some soils (Power 1974 Cited by Fredriksen and Harr 1979).

Road construction contributes more to losses in soil productivity than any other timber management activity (Rice et al. 1973). Excavation of soil from its natural position alters the natural drainage of slope and exposes soil to elements on steeper slopes; a cut at a critical point can trigger landslides. Road fills add weight to the underlying soil mass, and on steep hillsides they can trigger landslides or slip failures.

Adverse impacts from any mining and oil and gas exploration/development would occur mainly from road construction and other related surface disturbing activities (i.e., construction of drilling pads, excavation associated with placer mining). Under all the alternatives, these activities would have local impacts and would not significantly affect soil resources over the short term.

Adverse impacts on soils from road construction and tractor logging would be unavoidable under all the alternatives, but they would be in proportion to the number of acres harvested. Thus, impacts would be least under the Enhanced Alternative and greatest under the Preferred, Production, and No Action Alternatives. There would be substantially, no difference in impacts between the latter three alternatives.

Impacts on Water Resources

Sources of increases in water yield are compacted soils and roads. The increases in water yield under any of the alternatives are not expected to significantly affect the stream flow of the rivers draining the John Day Planning Area.

The small amount of available data on the area's streams (Table H-5 in Appendix H) indicates that the greatest potential impacts on water quality would be from increased suspended sediment loads and water temperatures. Dissolved oxygen, calcium carbonate, nitrate, sulfate, copper and pH in the past have been within ranges considered normal for these stream types, and would not be expected to be significantly altered under all of the alternatives.

Adverse impacts on water quality, in terms of increased sediment loads, could be expected in streams adjacent to pastures receiving heavy grazing pressure. Trampling and removal of vegetation by livestock compact soil surfaces and increase sediment yields (Lusby 1970). Grazing systems which incorporate rest and allow ground cover to increase have been found to decrease sediment yields (Aldon 1964). Under the No Action Alternative, approximately 36,000 acres of pasture in the I category allotments would be designated for spring-summer grazing or spring-early rotation grazing (see Table C-2). Both systems allow only a brief period of deferment, and over the long term, could adversely impact sediment loads on area streams. Under the other three alternatives, grazing systems utilizing longer rest periods are proposed and would minimize adverse effects on water quality.

Livestock grazing of stream-riparian areas can have several adverse effects on water quality. The reduction or removal of streambank vegetation by cattle can substantially increase water temperatures (Claire and Storch 1977; Brown and Krygier 1967). Claire and Storch (1977) found that stream temperatures were 12°F higher in grazed portions along the Deschutes River in Central Oregon than in ungrazed portions. Sloughing and collapse of streambanks which result in increased

suspended sediment loads of the streams, can also occur from livestock grazing (Platts 1981).

Impacts to water quality from grazing of stream-riparian areas would be least under the Enhanced Alternative, because livestock would be restricted and/or excluded from riparian areas along 76 stream miles. Some impacts could be expected from the Preferred, Production, and No Action Alternatives, because livestock would continue to graze in stream-riparian zones.

The major forest management activities that would adversely impact water quality in the John Day RMP Area include road construction and timber harvesting. The type of yarding system and seasonal timing used in timber harvesting influences sediment concentrations in nearby streams. Tractor logging typically produces high sediment concentrations (Reinhart and Eschner 1962) due to the high percentage of the soil surface that is disturbed. Utilization of cable or aerial systems impacts water resources much less, and in some studies, sediment yields showed no increase after harvesting with these techniques (Brown 1978).

Road construction far overshadows logging as a cause of increased sediment loads in stream systems. Researchers report increases of as much as 250 times (Fredriksen 1970) to 320 times (Megahan and Kidd 1972) normal sediment production from construction of roads in forested areas. After construction, sediment originating from the barren road surfaces can contribute to high suspended sediment loads for more than five years (Megahan and Kidd 1972).

Localized increases in suspended sediment loads would be unavoidable from road construction and tractor logging under all the alternatives. Impacts would be in proportion to the number of acres of timber harvested and amount of road constructed. Thus, impacts would be least under the Enhanced Alternative and greatest under the Preferred, Production, and No Action Alternatives. There would be no substantial difference in impacts between the latter three alternatives.

Adverse impacts on water quality from mining and oil and gas exploration/development would be the same under all alternatives and would be mainly in the form of increased sediment loads from the erosion of barren road surfaces and mine tailings. The effects of the increased loads on major streams are not expected to be significant, while the effects on small-order streams could be locally significant.

Because of the improved grazing systems and design features proposed, sediment yield generally is expected to decline under all alternatives except the No Action Alternative, under which it would remain essentially unchanged. The decline in sediment yield would be greatest under the Enhancement Alternative and least under the Production Alternative.

Impacts on Vegetation

Management actions impact vegetation by changing the species composition in the long term and the structure and production in the short term. Permanent changes occur when the top soil is excavated or severely displaced.

Grazing Management

Because no change is expected from the existing situation on the M and C category allotments, these areas are not discussed further.

Changes in vegetative characteristics such as range condition and forage production are dependent upon changes in plant species composition. A summary of the long-term impacts of grazing management to vegetation is shown in Table 4-1.

Impacts to vegetation types will not be discussed separately because the plants most affected by the alternatives are found in almost every vegetation type. Consequently, the expected changes in key species would occur in nearly every vegetation type, although in somewhat different proportions depending upon the present composition and potential of the site and the actions being proposed.

The following analysis identifies the general changes in composition of the key species that are expected to result from the components of each alternative, i.e., forage use, grazing systems and range improvements. Because significant composition changes usually take several years, the following analysis discusses only long-term impacts.

This section discusses the effect of proposed utilization levels and grazing systems on key species composition. For the purposes of analysis, light utilization is defined as up to 40 percent of current year's growth, moderate utilization is defined as from 41 to 59 percent, and heavy utilization is defined as 60 percent and over. Generally, light and moderate utilization levels increase or sustain the vigor of key species, while heavy utilization reduces photosynthesis below

Table 4-1 Long Term Impacts to Vegetation from Grazing Management¹

Vegetative Characteristics	Existing Situation	Alternatives			
		A Preferred	B Production	C Enhancement	D No Action
Range Condition ² (Percent of Acres)					
Late Seral	17	35	40	37	17
Middle Seral	33	20	25	15	35
Early Seral	20	15	5	18	18
Unclassified	30	30	30	30	30
Forage Production (AUMs)	8,227	8,638	10,284	3,927	8,227

¹ See Appendix B for proposed range improvements, Appendix C for proposed grazing systems and Appendix F for methodology.

² I category allotments (56,050 acres).

Table 4-2 Impacts of Grazing Systems on Vegetation

No.	Allotment % ¹	Riparian Areas ²	Impacts by Alternative			No Action (Existing Situation)
			Preferred	Production	Enhancement	
4007	4		NC	-	NC	NC
4049	9	X	NC	-	NC	NC
4052	20	X	+	+	+	NC
4068	6		NC	NC	NC	NC
4086	7		NC	NC	NC	NC
4097	5		NC	NC	NC	NC
4098	3		+	+	+	NC
4103	9	X	+	+	+	NC
4120	6		+	+	+	NC
4124	4		+	+	+	NC
4151	17		+	NC	+	NC
4156	4	X	+	+	+	NC
4163	1		NC	NC	NC	NC
4164	5		+	+	+	NC
	100%					

+ = Beneficial

- = Adverse

NC = No Change

¹ This is the percent of total public land acres (56,050) in I category allotments which is in an allotment.

² Indicated allotments have substantial/important riparian areas.

levels needed to maintain root reserves, diminishing the vigor of key species (Heady 1975). However, under most grazing systems, the timing of grazing use is the most important factor affecting key species composition. For example, during the critical part of the growing season (normally May 15 to July 15, depending on the elevation) plants are drawing on stored carbohydrates to develop flower stalks and vegetative growth. In most native key species, carbohydrate reserves are replenished during the later stages of this period prior to seedripeness. The critical period of growth ends when the plant has replenished its carbohydrate reserves and has produced seed (see Table C-1). Moderate utilization during the period of critical growth may result in reduced vigor, evidenced by fewer seedstalks, lower vegetative production and a smaller crown size, while heavy grazing during this period can completely deplete plant reserves, eventually killing the key species and allowing a corresponding increase in less palatable plants.

But moderate or heavy grazing after the critical growing period would not significantly reduce plant vigor.

Impacts of grazing systems and utilization levels on key species composition are summarized in Table 4-2. See Appendix C for description and effects of the grazing systems.

The construction of range improvements would cause a short-term and long-term disturbance of vegetation as shown in Table 4-3. The largest change in species composition would be caused by the proposed vegetation manipulation.

The acreage of vegetation manipulation shown in Table 4-3 represents a percentage of the two major vegetation types. These percentages are shown by alternative in Table 4-4.

Table 4-3 Acres of Disturbance Due to Proposed Range Improvements in I Category Allotments

Range Improvements	Alternatives											
	Preferred			Production			Enhancement			No Action		
	Units	Temp.	Perm.	Units	Temp.	Perm.	Units	Temp.	Perm.	Units	Temp.	Perm.
Fence	26.5 mi	13	0	26.5 mi	13	0	12.75 mi	6	0	9.0 mi	4	0
Spring Development	29	7	0	29	7	0	17	4	0	5	1	0
Pipelines	2 mi	4	1	2 mi	4	1	0	0	0	2 mi	4	1
Reservoirs	40	80	40	40	80	40	18	36	18	4	8	4
Juniper/Brush ¹	1,905	1,905	0 ²	2,235	2,235	0 ²	0	0	0	850	850	0
Control and Seeding												
Juniper/Brush												
Control Only ¹	2,485	2,485	0 ²	4,275	4,275	0 ²	1,200	1,200	0 ²	275	275	0
Cattleguards	0	0	0	2	0	0	0	0	0	0	0	0
Total		4,494	41		6,614	41		1,246	18		1,145	5

¹ These acres would not have actual surface disturbance as would occur with construction of the other range improvements. However, if burned, the existing vegetation would be removed, exposing the soil to wind and water erosion.

² Long term changes in species composition would occur.

Table 4-4 Percent of Vegetation Type Impacted by Vegetation Manipulation by Alternative

Vegetation Type	Alternatives			
	Preferred	Production	Enhancement	No Action
	%	%	%	%
Big Sagebrush	3	3	0	1
Western Juniper	8	12	2	2



Livestock forage production is expected to increase significantly under the Preferred and Production Alternatives. In a review of several grazing studies on western ranges, Van Poollen (1979) concluded that production increases between 5 and 21 percent were attributable to the implementation of grazing systems. In some cases, cheatgrass, an annual not considered a key species, contributes significantly to forage production. In general, key species are the preferred forage species, thus when key species increase, forage production also increases, and as key species decrease, forage production declines.

The future forage production presented in Table 4-1 was predicted using the methodology outlined in Appendix F. The future forage production of both the seeded and native range areas was based upon the present production of areas which have undergone similar treatments.

Riparian and Wetland Vegetation

Impacts to riparian vegetation are based on the expected change in the composition of woody species (primarily willow). Impacts to vegetation in wetland areas are based on the expected changes in herbaceous species (primarily sedges and rushes). Table C-3 shows the effects of grazing

systems on riparian key species. Response to grazing management would occur primarily in the stream side riparian areas which are accessible to livestock and are currently in poor or fair condition (using the wildlife habitat ratings). Good condition areas are generally inaccessible to livestock due to dense shrub cover, existing fences or steep, rocky topography. Therefore, many would not be impacted by any of the alternatives.

Most of the riparian areas in poor and fair condition are currently under spring/summer or deferred grazing management. These areas would have significant increases in riparian woody key species under the Preferred and Enhancement Alternatives due to exclusions or preferential management of the riparian vegetation in poor and fair condition. The effect of exclusion is discussed under grazing systems in the preceding section.

Under all alternatives, small unquantified areas of access to water by livestock (water gaps) adjacent to exclusion areas would have virtually all woody vegetation removed.

Forest Management

Both target (commercial tree species) and non-target vegetation in areas scheduled for timber

management would be directly affected by road building, timber harvest, yarding practices and vegetation manipulation. The degree to which existing and future vegetation would be affected depends on the intensity of each management action. The impacts to riparian vegetation would vary by alternative but they are expected to be insignificant due to buffer strip provisions. Areas within and adjacent to minor streams and draws (non-perennial) would be harvested under all alternatives but harvesting would include stipulations to mitigate the impacts. However, these impacts would temporarily alter the structural characteristic of the riparian vegetation.

Sites designated for permanent use of roads, landings, rock pits and major placer mining operations would not support vegetation and would therefore represent a direct loss of habitat, but only minor acreages are involved. During the coming decade vegetation eliminated by road construction is expected to vary from approximately 78 acres under the Enhancement Alternative to more than 131 acres under the Production Alternative.

Harvesting alters existing forestland vegetation and affects future plant communities. Overstory removal and soil disturbance are the major habitat modifications. Pioneer species may colonize disturbed ground, initiating secondary succession within the stand. Partial cuts essentially represent conversion of old growth, mature and second growth conifers to early successional stages. Acres that would be affected by harvest over the next 10 years range from approximately 6,027 under the Enhancement Alternative to approximately 10,090 under the Production Alternative.

Continuation of intensive timber management would not allow future forest stands within the intensive timber production base to achieve old growth status. Some plant species associated with older age timber stands could be permanently excluded from intensively managed forestlands. In addition, younger age classes exhibit simpler structure. They contain fewer species and less variety in height, age and distribution of plants.

Vegetation, slash and/or the condition of the ground surface at selected sites is commonly altered to reduce fire hazard and to expedite reforestation. Impacts of burning depend on the distribution, type and amount of fuel. Past activities indicate that slash pile burning causes a severe impacts. Most of the harvested acreage in the RMP area would be lightly burned or unburned.

Usually reforestation of partial cut areas is accomplished by natural regeneration. Occasionally reforestation is accomplished artificially by mechanical seeding or hand planting. Nursery-grown conifer seedlings are sometimes planted the first or second year following harvest. After 10 to 15 years the commercial tree species reforested can dominate other vegetation, limiting plant diversity in transitional plant communities.

Sensitive, Threatened, or Endangered Plants

Unidentified populations of sensitive, threatened or endangered plant species in previously undisturbed areas could be susceptible to any impacts described in the vegetation section.

Beneficial impacts could occur to plants which are palatable to livestock and are located within the proposed exclusion areas. The removal of livestock could allow these plants to expand into adjacent suitable habitat. On the other hand, livestock exclusion could favor plants which are preferred by livestock and which may be in competition with the sensitive plants. Without information about the response to grazing, the impact of proposed changes in grazing management cannot be predicted. Adverse impacts due to vegetation manipulation and range improvement construction would be avoided by conducting intensive plant inventories of the project area and modifying the design as needed in accordance with Bureau policy (Chapter 2; Appendix B).

Conclusions

Long term impacts to vegetation from livestock grazing would be mostly beneficial under the Production, Enhancement and Preferred Alternatives in descending order. Under these three alternatives, roughly 20 percent of the acres in I category allotments are expected to improve. The Production and Preferred Alternatives would improve vegetation through implementation of grazing systems and range improvements. Under the Enhancement Alternative, vegetation would be improved by reducing livestock grazing and restricting or excluding livestock grazing in riparian areas. Under the Preferred Alternative, the proposed grazing systems and improvements would improve most riparian areas, but not to the extent of the Enhancement Alternative.

Forage production would increase under the Preferred and Production Alternatives due to grazing systems that improve plant vigor and

vegetation manipulation of high potential — low production sites that would have little or no opportunity to improve in a reasonable length of time under other management schemes. See Table 4-1 for comparison by alternative.

The most significant grazing management action that impacts species composition is vegetation manipulation (brush control and/or seeding). These impacts though not large would be greatest under the Production and Preferred Alternatives and the least under the No Action and Enhancement Alternatives, respectively.

Changes in riparian and wetland vegetation due to grazing management would result in static condition for No Action Alternative and improved condition for Preferred and Production of poor and fair condition sites and no change in good or excellent condition sites.

Alterations to the structure and development of forest plant communities would be the most severe, long-term and widespread impacts of the timber management program. Under intensive timber management, existing older forest communities scheduled for timber harvest would be converted to earlier successional stage communities. These impacts would be the greatest under the Production Alternative followed by the Preferred, No Action and Enhancement Alternatives, respectively. However, difference between the Production, Preferred and No Action is insignificant.

Short-term use of commercial forestlands for timber harvest would increase long-term production of wood fiber as old, slow-growing stands are replaced by young, fast-growing stands managed for optimum wood production. In the long term, as the area approaches a balance of age classes, maximum growth of commercial conifers would be achieved. Intensive timber management practices such as thinning, slash disposal and planting would favor survival of conifers and would suppress, but not eliminate shrubs and herbaceous plants. Diversity and complexity of plant communities would diminish as maximum growth of commercial conifers is emphasized.

Impacts on Wild Horses

Altering the size of the Murderer's Creek Herd Management Area as proposed in the Preferred and Production Alternatives would not significantly impact the size and vitality of the herd. The herd population numbers would be kept in the proximity of 100 animals under all alternatives except Enhancement. Under this

alternative, herd numbers would be allowed to reach approximately 522 animals.

Impacts to Wildlife

The greatest impacts are long term and, in most cases, occur to animal habitats rather than to populations.

None of the alternatives would have an effect on peregrine falcons or bald eagles.

The grazing systems would favor wildlife species that are dependent on grasslands as a major component of their habitat while adversely impacting cover and forage for browse dependent species. These adverse impacts would be greatest in the Production Alternative and least in the Enhancement Alternative with moderate impacts in the Preferred and No Action Alternatives.

Populations of species dependent on riparian habitat would benefit slightly under the Preferred Alternative due to added protection from livestock use. The Production Alternative would have adverse impacts on the populations dependent on riparian areas due to increased livestock use while the No Action Alternative would have no significant impact. The riparian habitat and the animals using this habitat would benefit greatly from the proposed livestock restriction and exclusion in the Enhancement Alternative.

Wildlife species, such as elk which need thickly forested lands during portions of the year and species requiring snags, would benefit slightly under the Preferred Alternative and greatly under the Enhancement Alternative. The Production Alternative would result in moderate adverse impacts. Impacts occurring under the No Action Alternative are not expected to be significant.

Riparian areas and populations of dependent species within forested tracts would be favorably impacted by protection from logging activities under the Preferred and Enhancement Alternatives, but would experience moderately adverse impacts under the Production Alternative. The No Action Alternative would have no significant impact.

Perry and Overly (1977) have shown that elk use is reduced within one-half mile of roads, which in some cases, tends to decrease the use of otherwise suitable habitat. Also, road construction and upgrading results in increased human disturbance and a probable increase in poaching. The need for road construction increases as the

timber harvest increases. The Production Alternative, having the highest level of timber harvest, would have the highest degree of adverse impacts, followed in a decreasing order by the No Action, Preferred and Enhancement Alternatives.

Juniper and brush control would result in some loss of cover and browse for deer. In the allotments affected (Table B-1), the Production Alternative would result in the most adverse impact with the Preferred Enhancement and No Action Alternatives having fewer impacts in a decreasing order respectively.

The adverse impacts from timber stand improvements would be greatest under the Production Alternative and progressively diminish under the No Action, Preferred and Enhancement Alternatives. These impacts would be on populations that require dense and old growth forests as habitat and would result chiefly from thinning and systematic replacement of old growth with younger aged stands.

Conclusion

Impacts on wildlife are summarized in Table 4-5.

Impacts on Fish

The analysis of impacts to fish and aquatic habitat is based on expected impacts to four habitat parameters: food sources, water temperatures, water chemistry and condition of bottom materials.

Primary food sources for fish, particularly salmon and trout, are aquatic and terrestrial invertebrates (mainly insects). These food sources are damaged by increased sediments and degradation of riparian zones. Suspended sediments reduce light penetration thereby reducing algae and phytoplankton production, an important food source for aquatic invertebrates. Settled sediments smother and destroy aquatic invertebrates and their habitat. Terrestrial invertebrates are added to the aquatic system from overhanging and nearby vegetation. Insects falling from multi-storied vegetation provide a constant and plentiful food source. According to Erman et al. (1977), undisturbed buffer strips at least 30 meters (about 100 feet) wide either side of a stream are needed to maintain insect populations.

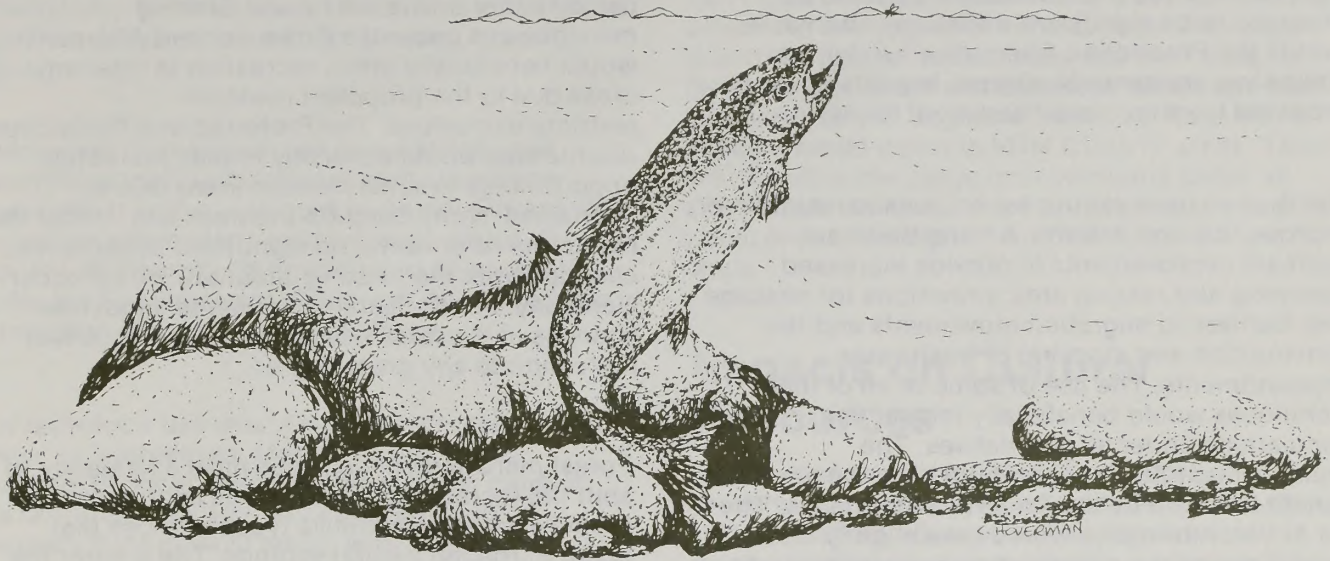
Water temperatures are critical for optimum fish production. High summer water temperatures can

Table 4-5 Estimated Population Changes in Selected Wildlife by Alternative

Population	Preferred	Production	Enhancement	No Action
Mule Deer				
Short Term	NC	-L	NC	NC
Long Term	NC	-L	+L	NC
Elk				
Short Term	NC	NC	NC	NC
Long Term	NC	-M	+H	NC
Other Upland Species				
Short Term	NC	NC	NC	NC
Long Term	NC	NC	NC	NC
Wetland Species				
Short Term	+L	-M	+H	NC
Long Term	+L	-M	+H	NC
Riparian Species				
Short Term	NC	-L	+M	NC
Long Term	+L	-M	+H	NC

NC = No Change
- Adverse; + Beneficial
L = Low

M = Medium
H = High



reduce dissolved oxygen, increase the incidence of fish disease, inhibit upstream fish passage, overcrowd juvenile rearing areas and reduce food production. Low winter temperatures can slow egg incubation.

Several water chemistry parameters are important to fish production: dissolved oxygen, pH, alkalinity, sulfate, nitrate nitrogen and phosphate. Changes in these parameters which place levels outside ranges considered optimum for fish production can reduce fish populations.

The condition of bottom materials are essential to the health of fish populations. Excessive sediments affect fish by reducing aquatic food sources, cementing or covering spawning gravels, smothering eggs and trapping newly hatched fry in the gravel.

Chapter 4, Impacts on Water Resources and Impacts on Vegetation, provides information on potential changes in riparian vegetation and water quality including sediments, water chemistry and water temperatures. The analysis and conclusions are based on those data.

Grazing riparian areas would have moderately

adverse impacts on fish populations under the Production and No Action Alternatives and minor, adverse impacts under the Preferred Alternative.

Under the Enhancement Alternative, there would be a beneficial impact.

To avoid or minimize impacts on fish and aquatic habitat from timber harvest activities, the Bureau employs a number of protective measures which vary by alternative. Buffer strips (see Glossary) and heavy equipment restrictions are two examples of these measures. Localized adverse impacts to fish populations would be greatest under the Preferred, Production and No Action Alternatives and least under the Enhancement Alternative, but the overall impacts would be insignificant under all alternatives.

Mining, oil and gas, and geothermal exploration/development could have significant localized adverse impacts under all alternatives. Platts (1972) found that sediment and heavy-metal pollution completely eliminated runs of chinook salmon and steelhead trout that had occupied the Panther Creek drainage, Idaho, before mining. These impacts could be long term as reductions in fish and aquatic invertebrate populations have been noted in streams draining abandoned mine

areas as long as 20 years after abandonment (Matter et al. 1978; Brown and Johnston 1976; Platts et al. 1979).

Impacts to the fish resource from road construction and maintenance would not be expected to be significant under any alternative except the Production Alternative. Under this alternative, moderately adverse impacts could be expected from increased sediment loads.

The Bureau uses various techniques to maintain or improve fish populations. Among these are instream improvements to provide increased spawning and rearing area, provisions for passage over barriers to migration movements and the construction and stocking of freshwater impoundments. The use of some or all of these techniques would beneficially impact fish populations under all alternatives. The Enhancement Alternative would have the greatest benefit followed by the Preferred Alternative. The No Action Alternative would have slightly less benefit due to the construction and stocking of fewer freshwater impoundments. The Production Alternative would have the least beneficial impact to fish populations as no instream improvements would be accomplished under this alternative.

Overall, fish populations would increase under all alternatives. Under the Preferred, No Action and Production Alternatives this increase would be due in its entirety to instream fish habitat improvements and expansion of steelhead and flat water habitat. Under the Enhancement Alternative slight decreases in sediment loads and summer water temperatures, from changes in grazing management, would add to the increase in fish populations.

Impacts on Recreation

Impacts on hunting, fishing and other wildlife-associated recreation would be dependent upon impacts to the species sought (see Impacts to Wildlife, this chapter). In some areas, livestock exclusions and riparian habitat protection would enhance fishing and hunting.

Impacts on general sightseeing are related to the effects on scenic quality (see Impacts on Visual Resources, this chapter). Under the Preferred and Production Alternatives, visual contrasts could cause short-term visitor use reductions due to recreational experience and scenic quality degradation. However, in the long term, sightseeing opportunities and recreational experiences would be enhanced as forage abundance and quality improve.

The primary impact of grazing on recreation is in riparian zones. In some cases, grazing affects the desirability of a site to such an extent that recreationists choose not to participate in an activity. However, in most cases, recreation use and livestock use can coexist on the same site if use by either one is not heavy. Grazing management under the Enhancement Alternative would beneficially affect recreation in riparian areas due to the proposed livestock restricts/exclusions. The Preferred and Production Alternatives would adversely impact recreation opportunities in some riparian areas due to intensified, short-duration livestock use. Under the No Action Alternative, no significant impacts (i.e., changes from the existing situation) would occur. Generally, in nonriparian allotments, moderate changes in livestock use do not adversely affect recreation to any great degree.

Forest management activities have a tendency to shift the recreation opportunities in an area from primitive or semi-primitive types to those that occur in roaded natural settings. The greater the amount of forest management activity in an area, the greater the amount of displacement. Hunting generally increases with increased road access, as do driving for pleasure, ORV use, woodgathering, and other activities using motorized vehicles. Motorized trail riding and most nonmotorized activities are reduced or completely displaced. Three alternatives would cause the greatest displacement (shift) in recreation use patterns and the Enhancement Alternative, the least shift. Between the Preferred, Production and No Action Alternatives, the displacement would not be substantially different.

Mining affects nonmotorized forms of recreation such as horseback riding, hiking, picnicking, fishing, more than motorized recreation.

Range improvement projects which impair access and/or degrade site integrity or recreational experiences would result in site-specific adverse impacts within certain activity areas under the Preferred and Production Alternatives.

Fencing would impede access for some recreationists. The resultant long-term impact would be more an annoyance to recreationists, causing slight localized reductions or relocation of visitor use in some activities (e.g., fishing, hunting, sightseeing). Elsewhere, fencing would stabilize streambanks and improve fishing. Water developments would attract wildlife and enhance hunting and sightseeing opportunities. Unimproved trails and tracks created during project construction would result in improved access for dispersed recreation. These trails and

tracks may also create adverse impacts to those recreationists who perceive them as degrading natural rangeland conditions. The No Action Alternative would result in the least impacts due to new range improvement construction followed by the Enhancement, the Preferred and Production Alternatives. None of these alternatives would have significant impacts on recreation uses, except fishing.

Anticipated increases in fish populations, due primarily to installation of instream structures, would result in like increases in Angler Days. This recreation parameter would increase about 92 percent, 49 percent, 38 percent and 15 percent under the Enhancement, Preferred, No Action and Production Alternatives, respectively.

Net recreation use would increase as projected under all alternatives. Motorized use would continue to occur randomly throughout most of the resource area. Use would continue to be relatively light in most areas, with heavier use occurring in specific places close to urban areas such as John Day and Canyon City. Other recreational activities would increase at the present rate. Visitor use reductions would tend to balance increases in visitor use in activities beneficially impacted.

Areawide use for public lands in the John Day RMP Area would show about a 22 percent increase over existing levels (see Table 3-14 in Chapter 3) for a total of about 44,000 visitor days on Bureau administered lands in 1997 under all alternatives. Displacement or shifts in recreation use patterns would be the greatest under the Production Alternative and would be less significant under the Enhancement, Preferred and No Action Alternatives respectively.

Impacts on Visual Resources

Under all alternatives, no significant impacts to visual resources are expected. Under the Preferred and Production Alternatives, rotation grazing systems have the potential to create contrast between grazed and rested pastures in some localized areas. Some improvements and vegetative manipulation projects would add visually acceptable variety in an otherwise monotonous landscape. Certain portions of the John Day RMP Area may experience slight degradation of visual quality. Range improvements for livestock which have the potential to create visual impacts would be the most numerous under the Production Alternative followed by the Preferred, No Action and Enhancement (see Table 4-6). Project design features, as well as VRM

program procedures and constraints, would minimize landform and vegetative contrast. In the long term, visual quality would improve as range condition improves.

Each type of range improvement was examined to determine the degree of contrast it would create within the typical landscape of the RMP area. Deviations from the characteristic landscape (see Glossary) vary in degree of contrast. No adverse impacts would occur in VRM Class IV areas. Table 4-6 identifies the range improvements under all alternatives which have the potential to exceed the visual impact consistent with VRM Class II and III lands.

Impacts on Cultural Resources

In accordance with the National Historic Preservation Act of 1966, as amended, Executive Order 11593 and Bureau policy, appropriate measures will be taken to identify and protect cultural sites prior to ground disturbing activities (see Appendix B, Standard Operating Procedures and design features for range improvements). Although some of the activities involved in implementation of the various management programs could affect cultural resource values, no adverse impacts are expected to occur to known cultural sites of significance.

Impacts on Mineral Resources

Impacts on mineral resources, resulting from shallow surface disturbances such as reservoir or road construction activities would be insignificant. None of the alternatives involve any new withdrawals of lands from uses authorized under the mining and mineral leasing laws; therefore, impacts under all alternatives would be insignificant. However, environmental analysis of individual mineral proposals will likely identify special operating stipulations for some mineral developments.

Impacts on Economic Conditions

The economic impacts are expressed in terms of the effects on dependence on public forage, ranch property values, and local income and employment from grazing, timber, fisheries and the construction of range improvements. As stated in the affected environment section, only the 12 permittees and 14 allotments in the I category are included in this analysis.

Table 4-6 Potential Impacts to Visual Resources

VRM Class	Alternatives					No Action	Allotments
	Preferred	Production	Enhancement				
Class II							
Seedings	1,380 acres	1,580 acres	200 acres		450 acres		4007, 4068, 4097, 4098, 4103, 4120, 4124
Brush Control	1,380 acres	1,780 acres	200 acres		100 acres		4007, 4068, 4097, 4098, 4103, 4124, 4163
Fences	12.8 miles	12.8 miles	5.3 miles		5.3 miles		4007, 4049, 4068, 4097, 4098, 4103, 4164
Springs	8	8	5		2		4007, 4049, 4052, 4097, 4103, 4124
Pipelines	0	0	0		0		
Reservoirs	18	18	10		3		4049, 4068, 4097, 4098, 4103, 4120, 4124, 4163
Class III							
Seedings	55 acres	65 acres	0		85 acres		4007
Brush Control	960 acres	1,600 acres	300 acres		680 acres		4007, 4068, 4097, 4156
Fences	4.2 miles	4.2 miles	3.0 miles		0		4052, 4068, 4156
Springs	9	9	3		2		4007, 4049, 4052, 4068, 4097, 4156
Pipelines	0	0	0		0		
Reservoirs	6	6	4		0		4007, 4052, 4068

It is assumed that leased acres identified for disposal would be used as rangeland regardless of ownership. The major potential impact to the operator would be the possible change in the lease rate.

The alternatives would not significantly alter the impacts from energy and mineral development.

With the exception of impacts related to fishing, no significant impacts related to recreational activities have been identified for any alternative.

Effect on Dependence on Public Forage

In determining the effect on dependence, active (paid) use in 1981 was subtracted from future allocations in each allotment. For analysis purposes, the initial allocations were divided among the permittees in proportion to 1982 active preference.

Table 4-7 shows how annual forage requirements of permittees would be affected by the alternatives. The table shows the number of operators in each herd size class, classified by whether they would have a loss, no change or a gain in public forage (forage from BLM-administered lands) in terms of their annual forage requirements. Also shown in the table is the average change in public forage as a percent of annual requirements.

In the short term, a loss of less than 10 percent of annual requirements would be experienced by one permittee under the Preferred, Production and No

Action Alternatives. Under the Enhancement Alternative a loss of more than 10 percent would be experienced by four permittees and eight permittees would have smaller losses.

Some permittees would experience gains in forage as shown in Table 4-7. Other permittees are not affected by any alternative.

In the long term, a loss of less than 10 percent of annual requirements would be experienced by one permittee under the Preferred and No Action Alternatives. There would be no forage losses under the Production Alternative. Under the Enhancement Alternative, a loss of more than 10 percent would be experienced by four permittees and eight permittees would have smaller losses.

Effect on Ranch Property Values

Table 4-8 shows the effect on ranch property values. In the short term under the Preferred and No Action Alternatives, ranch values would not be affected. Under the Production Alternative twelve permittees would have a short term gain in ranch value. Under the Enhancement Alternative, 12 permittees would have the value of their property reduced.

In the long term, there would be a gain in ranch value for 12 permittees under the Preferred and Production Alternatives. Twelve permittees would have the value of their property reduced in the long term under the Enhancement Alternative. No change in ranch valuation would occur in the long term under the No Action Alternative.

Table 4-7 Number of Permittees Affected By Change in Public Forage *

Change in Forage as Percent of Annual Requirements	Herd Size Group				Herd Size Group			
	Under 400	400- 999	1000 +	Total	Under 400	400- 999	1000 +	Total
Preferred Alternative								
Short Term				Long Term				
Loss over - 10.0%	-	-	-	-	-	-	-	-
Loss under - 10.0%	1	-	-	1	1	-	-	1
No change	8	2	1	11	-	-	-	-
Gain under 10.0%	-	-	-	-	8	2	1	11
Gain 10.0%-19.9%	-	-	-	-	-	-	-	-
Gain 20.0% or more	-	-	-	-	-	-	-	-
Average Change	0%	0%	0%	0%	+ 1%	+ 1%	0%	0%
Production Alternative								
Short Term				Long Term				
Loss over - 10.0%	-	-	-	-	-	-	-	-
Loss under - 10.0%	1	-	-	-	-	-	-	-
No change	-	-	-	-	-	-	-	-
Gain under 10.0%	8	2	1	11	7	2	1	10
Gain 10.0%-19.9%	-	-	-	-	2	-	-	-
Gain 20.0% or more	-	-	-	-	-	-	-	-
Average Change	+ 1%	+ 2%	0%	+ 1%	+ 5%	+ 5%	+ 2%	+ 4%
Enhancement Alternative								
Short Term				Long Term				
Loss over - 10.0%	3	1	-	4	3	1	-	4
Loss under - 10.0%	6	1	1	8	6	1	1	8
No change	-	-	-	-	-	-	-	-
Gain under 10.0%	-	-	-	-	-	-	-	-
Gain 10.0%-19.9%	-	-	-	-	-	-	-	-
Gain 20.0% or more	-	-	-	-	-	-	-	-
Average Change	-7%	-19%	-2%	-9%	-7%	-19%	-2%	-9%
No Action Alternative								
Short Term				Long Term				
Loss over - 10.0%	-	-	-	-	-	-	-	-
Loss under - 10.0%	1	-	-	1	1	-	-	1
No change	8	1	1	11	8	2	1	11
Gain under 10.0%	-	-	-	-	-	-	-	-
Gain 10.0%-19.9%	-	-	-	-	-	-	-	-
Gain 20.0% or more	-	-	-	-	-	-	-	-
Average Change	0%	0%	0%	0%	0%	0%	0%	0%

*Change from active use.

Table 4-8 Number of Permittees With Loss or Gain in Ranch Value *

	Herd Size Group				Herd Size Group			
	Under 400	400- 999	1000 +	Total	Under 400	400- 999	1000 +	Total
Preferred Alternative								
	Short Term				Long Term			
Permittees With Losses	-	-	-	-	-	-	-	-
Total Loss (\$000)	-	-	-	-	-	-	-	-
Permittees With Gain	-	-	-	-	9	2	1	12
Total Gain (\$000)	-	-	-	-	+ 11.2	8.1	+ 3.2	+ 22.6
Net Change (\$000)	-	-	-	-	+ 11.2	+ 8.1	+ 3.2	+ 22.6
Production Alternative								
	Short Term				Long Term			
Permittees With Losses	-	-	-	-	-	-	-	-
Total Losses (\$000)	-	-	-	-	-	-	-	-
Permittees With Gain	9	2	1	12	9	2	1	12
Total Gains (\$000)	+ 12.4	+ 14.6	+ 3.2	+ 30.2	+ 56.4	+ 40.8	+ 16.1	+ 113.2
Net Change (\$000)	+ 12.4	+ 14.6	+ 3.2	+ 30.2	+ 56.4	+ 40.8	+ 16.1	+ 113.2
Enhancement Alternative								
	Short Term				Long Term			
Permittees with loss	9	2	1	12	9	2	1	12
Total loss (\$000)	-69.5	-150.9	-16.1	-236.5	-69.5	-150.9	-16.1	-236.5
Permittees With Gain	-	-	-	-	-	-	-	-
Total gain (\$000)	-	-	-	-	-	-	-	-
Net Change (\$000)	-69.5	-150.9	-16.1	-236.5	-69.5	-150.9	-16.1	-236.5

* Changes calculated at \$55 per AUM active preference. No changes in ranch value would occur under the No Action Alternative.

Effects of Changes in Public Forage Use on Income and Employment

The effects of the alternatives on personal income and employment are shown in Table 4-9. The changes in local personal income and jobs were estimated from changes in sales, which were assumed to vary proportionately with changes in AUMs. These changes may be overestimated if the permittees in the RMP area are not able to utilize the forage on public lands during the period it is offered.

In the short term under the Preferred, Enhancement and No Action Alternatives, local personal income and employment would be reduced. Under the Production Alternative, local personal income and employment would be increased assuming that all active grazing preferences were utilized.

In the long term, local personal income and employment would be increased under the Preferred and Production Alternatives, and reduced under the Enhancement and No Action Alternatives.

The construction of range improvements would generate local income and employment in the short term under all alternatives as shown in Table 4-9.

Effects of Timber Harvest

Effects of changes in the annual timber sales volume for each alternative on local personal income and employment are shown in Table 4-9.

In determining the effect of changes in timber harvest, the annual timber sales volume for each

alternative was subtracted from the 1979-83 average timber harvest.

Under the Preferred Alternative, there would be a loss of \$63,700 in local personal income and a loss of 3 jobs from the historical average. Under the Production Alternative, there would be a loss of \$40,700 in local personal income and a loss of 2 jobs. Under the Enhancement Alternative, the losses in local personal income and employment would amount to \$267,400 and 11, respectively. The losses under the No Action Alternative would amount to \$43,300 and 2, respectively.

Effects of Fish Habitat Improvements

As shown in Table 4-9, local personal income and employment would be increased under all alternatives in both the short and long terms as a result of increased stream fishing activity on both public and private land in the John Day Basin due to fish passage and habitat improvements.

In addition to these local effects, the increased anadromous fish reproduction expected from opening an additional 81 miles of spawning habitat would favorably impact both sport and commercial fisheries downstream, but available information is inadequate to quantify these effects.

Conclusion

The effects on local personal income and employment are summarized in Table 4-9. In the short term, under the Preferred Alternative, local income would decrease, but local employment would be unchanged. Under the Production Alternative, income would increase but employment would be unchanged. Both income and employment would decrease under the Enhancement and No Action Alternatives.

In the long term, both income and employment would decrease in the local area under all alternatives.

Table 4-9 Effects on Local Personal Income and Employment (Short-term/long-term changes in thousands of 1982 dollars and in jobs)

Activity	Change in Personal Income	Change in No. Jobs	Change in Personal Income	Change in No. Jobs
	Preferred Alternative		Production Alternative	
Public Forage	-0.2/+3.3	0/0	+4.5/+17.5	0/+1
Construction of Range Improvements*	+30.3/0	+2/0	+66.2/0	+2/0
Timber Harvest	-63.7/-63.7	-3/-3	-40.7/-40.7	-2/-2
Stream Fishing**	+11.9/+11.9	+1/+1	+3.6/+3.6	0/0
Total Change	-21.7/-48.5	0/-2	+33.6/-19.6	0/-1
Activity	Change in Personal Income	Change in No. Jobs	Change in Personal Income	Change in No. Jobs
	Enhancement Alternative		No Action Alternative	
Public Forage	-37.2/-37.2	-1/-1	-0.2/-0.2	0/0
Construction of Range Improvements*	+25.8/0	+1/0	+12.8/0	0/0
Timber Harvest	-267.4/-267.4	-11/-11	-43.3/-43.3	-2/-2
Stream Fishing**	+22.6/+22.6	+1/+1	+9.3/+9.3	0/0
Total Change	-256.2/-282.0	-10/-11	-21.4/-34.2	-2/-2

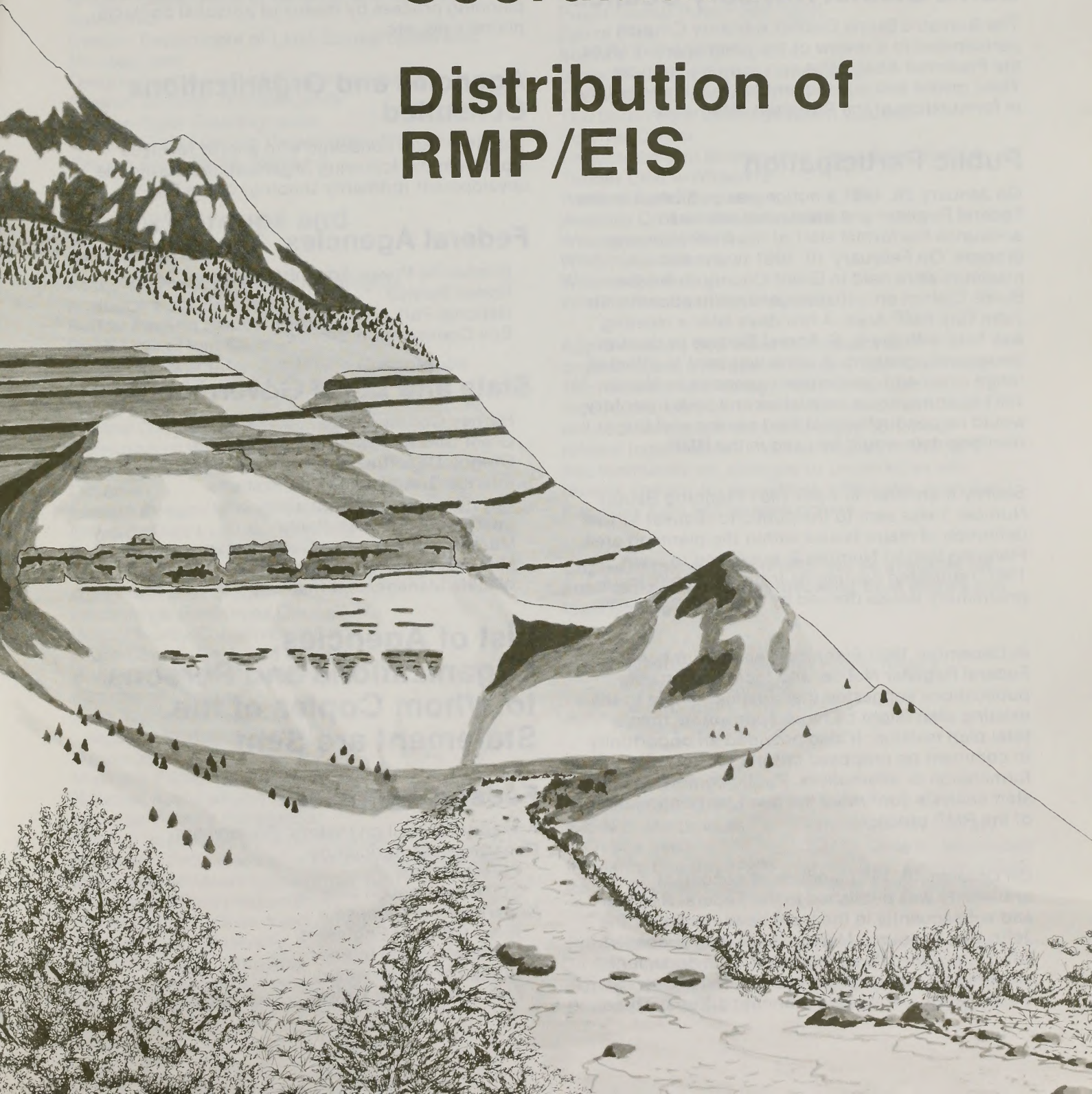
* Construction effects are distributed as average annual amounts over an assumed 10-year construction period. No long-term impacts due to construction are expected.

** Omits unquantified effects of increased anadromous commercial and sports fisheries in Columbia River and Pacific Ocean.

Chapter 5

Consultation and Coordination

Distribution of RMP/EIS



This resource management plan was prepared by an interdisciplinary team of specialists from the Burns District Office. Writing of the RMP began in October, 1983; however a complex process that began in 1981 preceded the writing phase. This process included resource inventory, public participation, interagency coordination and preparation of a management situation analysis (on file in the Burns District Office). Consultation and coordination with agencies, organizations and individuals occurred in a variety of ways throughout the planning process.

Burns District Advisory Council

The Bureau's Burns District Advisory Council participated in a review of the preliminary draft of the Preferred Alternative and scoping analysis. Their review and subsequent feedback was helpful in formulation of the Preferred Alternative.

Public Participation

On January 28, 1981 a notice was published in the Federal Register and local news media to announce the formal start of the RMP planning process. On February 10, 1981 two public meetings were held in Grant County to aid the Burns District on initial issue identification for the John Day RMP Area. A few days later a meeting was held with the U. S. Forest Service to discuss issues and concerns. A letter was sent to affected range users and government agencies in March 1981 to announce a vegetative and soils inventory would be conducted that field season and the resulting data would be used in the RMP.

Shortly thereafter, in April 1981 Planning Report Number 1 was sent to the public to request further definition of major issues within the planning area. Planning Report Number 2, published in June 1981, requested comments from the public in 14 preliminary issues derived by the earlier process.

In December 1982 Planning Report Number 3, a Federal Register Notice, and local news media publications suggested that an amendment to the existing plan might be more appropriate than a total plan revision. It also provided an opportunity to comment on proposed criteria for the formulation of alternatives. Public comments and staff analysis confirmed the need for continuation of the RMP process.

On October 18, 1983 a notice of document availability was published in the Federal Register and subsequently in the local news media for the John Day Resource Management Plan Proposed Land Use Alternatives brochure. This document provided an outline of proposed alternatives, listed major issues and revised planning criteria. Three

alternatives portrayed various resource programs showing an arrangement from emphasis on production of commodities to emphasis on enhancement of natural values with a midground alternative attempting to establish a point between the two. The fourth alternative portrays the existing situation. Four major issues were displayed and eleven planning criteria were cited for development or selection of the Preferred Alternative.

Other informal coordination with the public and government agencies took place throughout the planning process by means of personal contacts, phone calls, etc.

Agencies and Organizations Consulted

The RMP team consulted with and/or received input from the following organizations during the development (primarily scoping) of the RMP.

Federal Agencies

Bonneville Power Administration
Forest Service
National Park Service
Soil Conservation Service

State and Local Governments

Harney County Court
Grant County Planning Commission
Oregon Department of Fish and Wildlife
Interest Groups and Organizations
Dayville Grazing Association
Intermountain Consultants
Mazama Conservation Commission
Minerals Exploration Coalition
Wildlife Management Institute

List of Agencies, Organizations and Persons to Whom Copies of the Statement are Sent

Federal Agencies

Advisory Council on Historic Preservation
Department of Agriculture
Forest Service
Soil Conservation Service
Department of Defense
Army Corps of Engineers
Department of the Interior
Bureau of Indian Affairs
Fish and Wildlife Service

Geological Survey
National Park Service
Bureau of Mines
Bureau of Reclamation
Environmental Protection Agency

State and Local Governments

Grant County Planning Commission
Harney County Planning Commission
Oregon Department of Environmental Quality
Oregon Department of Fish and Wildlife
Oregon Department of Forestry
Oregon Department of Geology and Mineral Industries
Oregon Department of Land Conservation and Development
Oregon Department of Transportation
Oregon Division of State Lands
Oregon State Clearinghouse
Oregon State Historic Preservation Officer
Oregon State Parks, Region 5

Interest Groups and Organizations

Association of Oregon Archaeologists
Audubon Society
Belfair Packrat Search Rescue
Birch Creek Hunt Club
Columbia River Inter-Tribal Fish Commission
Confederated Tribes of the Umatilla Indian Reservation
Central Oregon Conservationists
Defenders of Wildlife
Delta Funds, Inc.
Desert Rats
Eastern Oregon Mining Association
Edward Hines Lumber Company
Environmental Impact Service
Environmental Education Center
1000 Friends of Oregon
Geothermal Resources Council
Grant County Conservationists
Grant County Resource Council
Hudspeth Sawmill Company
Institute of Ecology
Izaak Walton League
League of Women Voters
Mazamas
Maintain Eastern Oregon Wilderness
National Association Conservation Districts
National Wildlife Federation
Natural Resources Defense Council
Northwest Federation of Mineralogical Societies
Northwest Mineral Prospectors Club
Northwest Mining Association
Northwest Petroleum Association
Northwestern University
Ochoco Lumber Company
Oregon Cattlemen's Association
Oregon Council of Rock and Mineral Club

Oregon Environmental Council
Oregon Farm Bureau Federation
Oregon High Desert Museum
Oregon Historical Society
Oregon Natural Heritage Program
Oregon State University
Oregon Parks and Recreation Society
Oregon Sheepgrowers
Oregon Natural Resources Council
Oregon Wildlife Federation
PNW 4-Wheel Drive Club, Region 5
Pacific Power & Light Company
Pine Products
Public Lands Institute
Puget Sound Power and Light
Sierra Club
Siuslaw 4-Wheel Drive Club
Snow Mountain Lumber Company
The Nature Conservancy
The South Fork Drainage Basin Council
Survival Center
Threatened and Endangered Plant Commission
Timber Linn 4-Wheelers
Western Land Exchange
Western Oil and Gas Association
Whatever 4-Wheelers
Wilderness Society
Wilderness Group
Wildlife Management Institute

Approximately 300 other individuals and organizations will receive copies. Approximately 165 minerals and energy-related companies, individuals, corporations and related institutions will receive copies. Approximately 30 timber-related industries will receive copies of the RMP. Approximately six colleges or universities will receive copies. All permittees within the John Day Planning Area will receive copies.

Copies of this draft RMP/EIS will be available for public inspection at the following BLM offices and local libraries.

Washington Office of Public Affairs
18th and C Streets
Washington, D.C. 20240
Phone (202) 343-5717

Oregon State
Public Affairs Office
825 N.E. Multnomah
P.O. Box 2965
Portland, Oregon 97208
Phone (503) 231-6277

Grant County Library
507 S. Canyon Boulevard
John Day, Oregon 97845
Phone (503) 575-1992

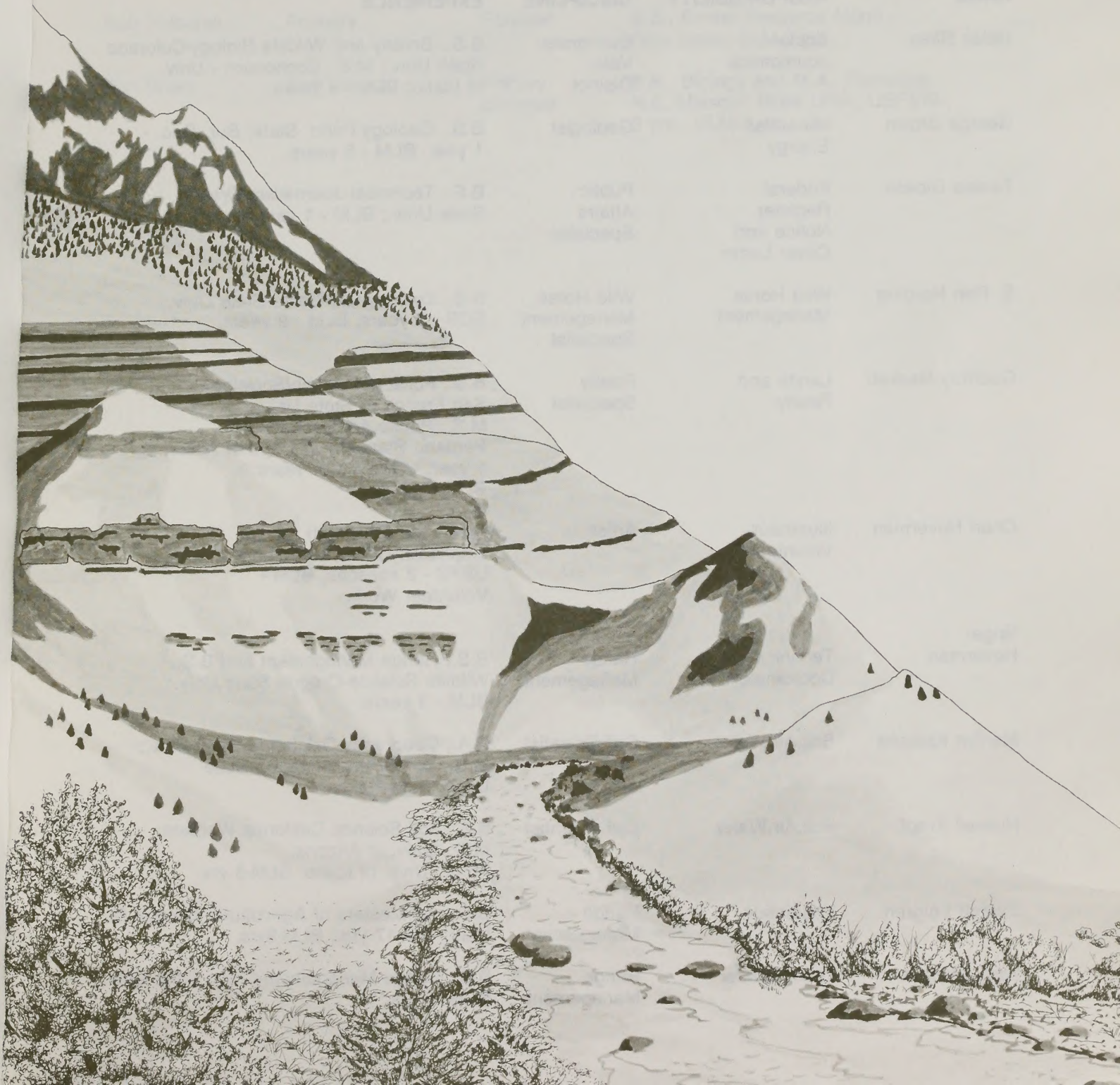
Burns District Office
74 South Alvord
Burns, Oregon 97720
Phone (503) 573-5241

Harney County Library
80 West "D" Street
Burns, Oregon 97720
Phone (503) 573-6670

Chapter 6

References

Glossary



List of Preparers

While individuals have primary responsibility for preparing sections of an EIS, the document is an interdisciplinary team effort. In addition, internal review of the document occurred throughout preparation. Specialists at the District and State Office levels of the Bureau both reviewed the analysis and supplied information. Contributions by individual preparers may be subject to revision by other BLM specialists and by management during the internal review process.

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Glossary of Terms

Accelerated Erosion — Erosion processes increased by the activities of man. See "Erosion".

Activity Planning — Site-specific planning which precedes actual development. This is the most detailed level of BLM planning.

Actual Use — The true amount of grazing AUMs based on the numbers of livestock and grazing dates submitted by the livestock operator and confirmed by periodic field checks by the BLM.

Adjustments — Changes in animal numbers, periods of use, kinds of class of animals or management practices as warranted by specific conditions.

Adverse Location (TPCC) — A subclass of problem sites which, because of its physical isolation, is difficult or impossible to manage for sustained yield timber production.

Allotment — An area of land where one or more livestock operators graze their livestock. Allotments generally consist of BLM lands but may also include other federally managed, state owned and private lands. An allotment may include one or more separate pastures. Livestock numbers and periods of use are specified for each allotment.

Allotment Management Plan (AMP) — A written program of livestock grazing management, including supportive measures if required, designed to attain specific management goals in a grazing allotment.

Alluvium — Soil and rock debris deposited by streams.

Animal Unit Month (AUM) — A standardized measurement of the amount of forage necessary for the sustenance of one cow unit equivalent for 1 month.

Anadromous — Fish which migrate from the ocean to breed in fresh water. Their offspring return to the ocean.

Aquatic — Living or growing in or on the water.

Aquifer — A rock formation, group of rock formations or part of a rock formation that contains enough water-saturated permeable material to yield water to a spring or well.

Archaeological Quarry Sites — Places where minerals occur which were a source of raw material for prehistoric/historic peoples.

Archaeological Site — Geographic locale containing structures, artifacts, material remains, and/or other evidence of past human activity.

Area of Critical Environmental Concern (ACEC) — An area designated for special management to protect unique resource values; including wildlife, botanical and scenic values.

Avoidance Areas — Land areas that pose particular environmental impacts which would be difficult or impossible to mitigate or which impose unusual engineering constraints.

Best Forest Management Practices — General forest management practices which are consistent for all timber harvest and treatment activities.

Big Game Animals — Limited to elk, mule deer, antelope and bighorn sheep in John Day Planning Area.

Board Feet — A unit of solid wood, one foot square and one inch thick.

Browse — To browse is to graze a plant; also, browse (noun) is the tender shoots, twigs and leaves of trees and shrubs often used as food by cattle, deer, elk and other animals.

Buffer Strip — A protective area adjacent to an area of concern requiring special attention or protection. In contrast to riparian zones which are ecological units, buffer strips can be designed to meet varying management concerns.

Camp Site — Area utilized by one or more tasks, which also shows evidence of occupation by the presence of housepits, midden deposits, and/or hearths.

Canopy Cover — The percentage of ground covered when a polygon drawn around the extremities of the undisturbed canopy of each plant is projected on the ground and all such projections on a given area are added together.

Carrying Capacity — The maximum stocking rate possible without damaging vegetation or related resources.

Catchment — A structure built to collect and retain water.

Channel — An open conduit either naturally or artificially created which periodically or continuously contains moving water or forms a connecting link between two bodies of water.

Channel Stability — A relative term describing erosion or movement of the channel walls or bottom due to waterflow.

Characteristic Landscape — The established landscape in an area, not necessarily a natural area. It could refer to a farming community, urban area or any other landscape which has an identifiable character.

Class I Cultural Inventory — An inventory of the existing literature and a profile of the current data base for cultural resources, frequently utilized to guide field inventories.

Class II Cultural Inventory — A sample-oriented field inventory which is representative of the range of cultural resources within a finite study area.

Class III Cultural Inventory — An intensive field inventory designed to locate and record, from surface and exposed profile, all cultural resources within a specified area.

Clayey — A soil containing more than 35% clay. The textural classes are sandy clay, silty clay, clay and clay loam and silty clay loam.

Climax — The culminating stage in plant succession for a given site where vegetation has reached a highly stable condition.

Commercial Forestland (TPCC) — Forestland which is capable of producing 20 cubic feet per acre of wood per year of commercial tree species.

Commercial Tree Species (TPCC) — Tree species whose yields are reflected in the allowable cut: pines, firs, spruce, Douglas fir and larch.

Compaction — The process of packing firmly and closely together; the state of being so packed, e.g., mechanical compaction of soil by livestock or vehicular activity. Soil compaction results from particles being pressed together so that the volume of the soil is reduced. It is influenced by the physical properties of the soil, moisture content and the type and amount of compactive effort.

Competitive Forage — Those forage species utilized by two or more animal species.

Critical Growth Period — A specified period of time in which plants need to develop sufficient carbohydrate reserves and produce seed, e.g., approximately the months of May and June for bluebunch wheatgrass.

Critical Wildlife Habitat — The area of land, water and airspace required for the normal needs and survival of an endangered species.

Crucial Wildlife Habitat — Parts of the habitat necessary to sustain a wildlife population at critical periods of its life cycle. This is often a limiting factor on the population, such as breeding habitat, winter habitat, etc.

Cultural Resources — Fragile and nonrenewable elements of the environment including archaeological remains (evidence of prehistoric or historic human activities) and sociocultural values traditionally held by ethnic groups (sacred places, traditionally utilized raw materials, etc.).

Cultural Site — Any location that includes prehistoric and/or historic evidence of human use, or that has important sociocultural value.

Deferment — The withholding of livestock grazing until a certain stage of plant growth is reached.

Deferred Grazing — Discontinuance of livestock grazing on an area for specified period of time during the growing season to promote plant reproduction, establishment of new plants or restoration of the vigor by old plants.

Deferred Rotation Grazing — Discontinuance of livestock grazing on various parts of a range in succeeding years, allowing each part to rest successively during the growing season. This permits seed production, establishment of new seedlings or restoration of plant vigor. Two, but more commonly three or more, separate pastures are required.

Diet Overlap — The presence of the same forage plant in the diet of several herbivores.

Distribution — The uniformity of livestock grazing over a range area. Distribution is affected by the availability of water, topography and type and palatability of vegetation as well as other factors.

Drainage (Internal Soil) — The property of a soil that permits the downward flow of excess water. Drainage is reflected in the number of times and in the length of time water stays in the soil.

Ecological Range Condition Classes — Four classes used to express the degree to which the composition of the present plant community reflects that of climax. They are:

Range Condition (Successional Stage)	Percentage of Present Plant Community That is Climax for the Range Site
Climax	76-100
Late Seral	51-75
Middle Seral	26-50
Early Seral	0-25

Ecological Site Inventory (ESI) — Based on SCS range sites; trend of ecological site.

Elimination Grazing — Relinquishment or cancellation of livestock grazing on public lands currently being grazed by livestock.

Endangered Species — A plant or animal species whose prospects for survival and reproduction are in immediate jeopardy, as designated by the Secretary of the Interior, and as is further defined by the Endangered Species Act of 1973, as amended.

Ephemeral Stream — A stream that flows only after rains or during snowmelt.

Erosion — The wearing away of the land surface by running water, wind, ice or other geological agents.

Erosion Susceptibility — The susceptibility of a soil to erosion when no cover is present. The rate of soil displacement depends on the physical properties of the soil, rainfall intensity and slope gradient.

Federal Land Policy and Management Act of 1976 (FLPMA) — Public Law 94-579. October 21, 1976, often referred to as the BLM's "Organic Act", which provides the majority of the BLM's legislated authority, direction, policy and basic management guidance.

Floodplain — The relatively flat area or lowlands adjoining a body of standing or flowing water which has been or might be covered by floodwater.

Forb — A broad-leafed herb that is not grass, sedge or rush.

Forestland — Land which is now, or is capable of being, at least 10 percent stocked by forest trees, and is not currently developed for nontimber use.

Formation — A sequence of rock strata which are recognizable over a large area.

Fragile Site (TPCC) — A subclass of problem sites whose timber growing potential is easily reduced or destroyed, loss of timber growing potential results from soil erosion.

Geomorphic — Pertaining to the form of the earth or its surface features.

Grazing System — The manipulation of livestock grazing to accomplish a desired result.

Ground Cover — Vegetation, mulch, litter, rock, etc.

Groundwater — Water contained in pore spaces of consolidated and unconsolidated surface material.

Habitat — A specific set of physical conditions that surround a species group of species or a large community. In wildlife management, the major constituents of habitat are considered to be food, water, cover and living spaced.

Habitat Management Plan (HMP) — A plan for management of habitat.

Historic — Refers to period wherein non-native cultural activities took place, based primarily upon European roots, having no origin in the traditional Native American culture(s).

Hunter/Fisherman Day — One person hunting or fishing during any part of one day.

Igneous Rocks — Rocks formed by solidification of molten earth materials. Intrusive igneous rocks are those solidified beneath the surface of the earth; extrusive igneous rocks emerged at the surface as molten

Infiltration — The penetration of water into the soil surface through pores of the soil. The rate and amount of infiltration is limited by the size and abundance of pores, organic matter content and the water absorption capacity of the soil.

Intermittent Stream — A stream which flows most of the time but occasionally is dry or reduced to pool stage.

Issue — A subject or question of widespread public discussion or interest regarding management of the John Day Planning Area and identified through public participation.

Interseeding — The practice of seeding native or introduced plant species into native range in combination with various mechanical treatments. Interseeding differs from range seeding in that only part of the native vegetation is removed to provide a seedbed for the seeded species.

Key Area (Grazing) — An area that receives at least moderate use, has the productive capability to respond to management and is important from a livestock standpoint.

Key Species — Major forage species on which range management should be based.

Land Treatment — All methods of range improvement and soil stabilization such as reseeding, brush control (burning and mechanical), pitting, furrowing, water spreading, etc.

Leasable Minerals — Minerals subject to lease by the federal government including oil, gas and coal.

Lithic — A stone or rock that may be either abraded into the proper form for use as a tool or shaped by knocking pieces (flakes) off. A cluster of flakes is called a "lithic scatter".

Livestock Operation — The management of a ranch or farm so that a significant portion of the income is derived from the continuing production of livestock.

Locatable Minerals — Generally the metallic minerals subject to development specified in the General Mining Law of 1872; with the resource area, includes bentonite gypsum, uranium minerals.

Management Situation Analysis (MSA) — A comprehensive display of physical resource data and an analysis of the current use, production, condition and trend of the resources and the potentials and opportunities within a planning unit, including a profile of ecological values.

Mineral Entry — The location of mining claims by an individual to protect his right to a valuable mineral.

Mitigation Measures — Methods or procedures committed to by BLM for the purpose of reducing or lessening the impacts of an action.

Multiple Use — Balanced management of the various surface and subsurface resources, with permanent impairment of the productivity of the land, that will best meet present and future needs.

National Register of Historic Places (NRHP) — A register of districts, sites, buildings, structures, and objects, significant in American history, architecture, archaeology, and culture, established by the Historic Preservation Act of 1966 and maintained by the Secretary of the Interior.

National Register Potential — Status of a cultural resource which is deemed qualified for the NRHP, prior to formal documentation and consultation; managed as if it were actually listed.

Noncommercial Forestland (TPCC) — Forestland which is not capable of producing 20 cubic feet per acre of wood per year of commercial tree species.

Noncommercial Tree Species (TPCC) — Species whose yields are not reflected in the allowable cut, regardless of their salability. Includes all hardwoods, juniper and Mountain mahogany.

Nonoperable — Forestlands unsuitable for any type of timber harvest activity due to their 1) physical features; for example, extremely rocky, boulder fields, rim rocks, rock outcrops and unsafe for logging operations and/or 2) forestlands on which logging activity will result in the loss of the sites potential for producing commercial tree species, for example loss of soil through erosion, slope failure and/or the inability to reforest the site within acceptable time limits (usually five to fifteen years) even with special reforestation techniques.

Nonproblem site (TPCC) — A subclass of commercial forestland which requires no special harvesting, reforestation, or other restrictive measures in order to be managed on a sustained yield basis.

Nonrestricted Forestland (TPCC) — Nonproblem sites in the timber base on which no special techniques are required for harvest, reforestation and other management practices.

Nonuse — Available grazing capacity in AUMs which is not permitted during a given time period.

Not Currently Available — Those lands which have been set aside due to other resource management considerations (e.g., wildlife, fisheries/riparian, Bald eagles, recreation, etc.).

Off-Road Vehicle (ORV) — Any motorized track or wheeled vehicle designed for cross-country travel over any type of natural terrain.

Old Growth Stand — A stand of trees that is past full maturity and showing decadence. Defined here as a stand having 37 or more trees per acre which are at least 21 inches in diameter at 4-½ feet above ground, two or more canopy levels and at least 70 percent total canopy closure.

Peak Discharge — The highest stage or channel flow attained by a flood, usually expressed as the volume of water in cubic feet passing a given point in a one second time period, hence, cubic feet/second.

Percentage of Use — Grazing use of current vegetation growth, usually expressed as a percentage of volume removed.

Perennial (Permanent) Stream — A stream that ordinarily has running water on a year-round basis.

Period of Use — The time of livestock grazing on a range area based on type of vegetation or stage of vegetative growth.

Permit/Leases (Grazing) — Under Section 3 of the Taylor Grazing Act, a permit is a document authorizing use of public lands within grazing districts for the purpose of grazing livestock. Under Section 15 of the Taylor Grazing Act, a lease is a document authorizing livestock grazing use of public lands outside grazing districts.

Permit Value — The market value of a BLM grazing permit which is often included in the overall market value of the ranch.

Petroglyph — A figure, design, or indentation carved, abraded, or packed onto a rock.

Pictograph — A figure or design painted onto a rock.

Plant Composition — The proportions of various plant species annual production in relation to the total annual production of all plants on a given area.

Plant Succession — The process of vegetative development whereby an area becomes successively occupied by different plant communities of higher ecological orders.

Prehistoric — Refers to period wherein Native American cultural activities took place which were not yet influenced by contact with historic non-native culture(s).

Prescribed Fire — A planned burning of live or dead vegetation under favorable conditions which would achieve desired results.

Problem Reforestation Area (TPCC) — A subclass of problem sites containing merchantable timber where it is anticipated that standard reforestation treatments will not result in the achievement of the minimum acceptable stocking level because of inherent site characteristics.

Problem Site (TPCC) — A subclass of commercial forestland which consists of adverse location, fragile sites, and problem reforestation areas. This subclass of land is either withdrawn from the timber production base or remains in the base subject to restrictions which call for the application or prohibition of certain management practices.

Proper Use — The degree and time of use of the current year's plant growth which, if continued, will either maintain or improve the range condition consistent with conservation of other natural resources.

Proper Use Factor — The degree of use a kind of grazing animal will make of a particular plant when the range is properly grazed.

Public Lands — Any land and interest in land (e.g. mineral estate) owned by the United States and administered by the Secretary of the Interior through the Bureau of Land Management. May include public domain or acquired lands in any combination.

Range Condition — The present state of vegetation of a range site in relation to the climax plant community of that site. It is an expression of the relative degree to which the kinds, proportions and amounts of plants in a plant community

resemble that of the climax plant community for that site. Range condition is basically an ecological rating of the plant community. Air-dry weight is the unit of measure used in comparing the composition and production of the present plant community with that of the climax community.

Range Improvement — A structure, excavation, treatment or development to rehabilitate, protect or improve public lands to advance range betterment. "Range Development" is synonymous with "Range Improvement".

Range Seeding — The process of establishing vegetation by mechanical dissemination of seed.

Range Site — A distinctive kind of rangeland in its ability to produce a characteristic natural plant community. A range site is the product of all the environmental factors responsible for its development. It is capable of supporting a native plant community typified by an association of species that differs from that of other range sites in the kind or proportion of species or in total production.

Range Trend — The direction of change in range condition and soil.

Raptor — Bird of prey with sharp talons and strongly curved beaks, e.g., hawks, owls, vultures, eagles.

Recreation and Public Purposes Act (R&PP Act) — This act authorizes the Secretary of the Interior to lease or convey public lands for recreational and public purposes under specified conditions of states or their political subdivisions, and to nonprofit corporations and associations.

Recreational Opportunity — Those outdoor recreation activities which offer satisfaction in a particular physical, social and management setting in the EIS areas; these activities are primarily hunting, fishing, wildlife viewing, photography, boating and camping.

Redd — A depression excavated by anadromous fish in which to lay their eggs.

Residual Ground Cover — That portion of the total vegetative ground cover that remains after the livestock grazing season.

Restricted Forestland (TPCC) — Problem sites in the timber base on which special techniques are required to protect the timber growing potential or to insure adequate regeneration within a specified time (usually five years).

Right-of-Way — A permit or an easement which authorizes the use of public lands for certain specified purposes, commonly for pipelines, roads, telephone lines, electric lines, reservoirs, etc.; also, the lands covered by such an easement or permit.

Riparian Habitat — Those areas where the vegetation complex and microclimate conditions are products of the combined presence and influence of perennial and/or intermittent water, associated high water tables and soils which exhibit some wetness characteristics.

Rock Art Sites — Petroglyphs or pictographs.

Rockshelter — Naturally formed recess in a rock formation which provided shelter to prehistoric occupants.

Runoff — The water that flows on the land surface from an area in response to rainfall or snowmelt. As used in this RMP, runoff from an area becomes streamflow when it reaches a channel.

Salable Minerals — High volume, low value mineral resources including common varieties of rock, clay, decorative stone, sand and gravel.

Salinity — A measure of the mineral substances dissolved in water.

Sandy Soil — A soil containing a large amount of sand. Textural classes are sands and loamy sands.

Scenic Quality — The degree of harmony, contrast and variety within a landscape.

Seasonal (Season Long) Grazing — Grazing use throughout a specific season.

Sediment — Soil, rock particles and organic or other debris carried from one place to another by wind, water or gravity.

Sensitive Species — Species not yet officially listed, but which are undergoing a status review or are proposed for listing according to a Federal Register Notice published by the Secretary of the Interior or Secretary of Commerce, or according to

comparable states documents published by state officials. (Reference Instruction Memorandum WO 80-722.)

Seral Stage — The series of relatively transitory communities, including plants and animals which develop during ecological succession, beginning after the Pioneer Stage (i.e., beginning with bare ground) to the Climax Stage.

Shrub — A low woody plant, usually with several stems, that may provide food and/or cover for animals.

Silviculture — The science and art of producing and tending a forest.

Smolt — A young anadromous fish that is moving downstream to the ocean.

Soil Productivity — The capacity of a soil in its normal environment to produce a specified plant or sequence of plants under a specified system of management.

Species of Special Interest or Concern — Plant or animal species not yet listed as "endangered or threatened" but whose status is being reviewed because of their widely dispersed populations or their restricted ranges. A species whose population is particularly sensitive to external disturbance.

Stocking rate — The amount of animal units on a specified area at a specific time, usually expressed in acres/AUM.

Streambank (and Channel) Erosion — This is the removal, transport, deposition, recutting and bedload movement of material by concentrated flows.

Succession — The changes in vegetation that take place as a plant community evolves from bare ground to climax.

Sustainable Annual Harvest — The yield that a forest can produce continuously from a given level of management.

Thermal Cover — Vegetation or topography that prevents radiational heat loss, reduces wind chill during cold weather, and intercepts solar radiation during warm weather.

Threatened Species — A plant or animal species that the Secretary of the Interior has determined to be likely to become endangered within the foreseeable future throughout all or most of its range.

Timber Base — (TPCC) Commercial forestland judged to be environmentally and economically suitable and available for the continuous production of timber; the land from which the allowable cut is calculated and harvested.

Timber Production Capability Classification (TPCC) — The process of partitioning forestland into major classes indicating relative suitability to produce timber on a sustained yield basis.

Total Dissolved Solids — The dry weight of dissolved material, organic and inorganic, contained in water.

Turbidity — An interference to the passage of light through water due too insoluble particles of soil, organics, micro-organisms and other materials.

Vegetation Condition — See Range Condition.

Vegetation (Ground) Cover — The percent of land surface covered by all living vegetation (an remnant vegetation yet to decompose) within 20 feet of the ground.

Vegetation Manipulation — Alteration of present vegetation by using fire, plowing, or other means to manipulate natural successional trends.

Vegetation Production — See Range Site.

Visitor Day — Twelve hours of recreational use by one or more persons. Visitor days may occur either as recreation visitor days or as nonrecreation visitor days.

Visual Resource(s) — The land, water, vegetation and animals that comprise the scenery of an area.

Visual Resource Management Classes (VRM) — The degree of acceptable visual change within a characteristic landscape. A class is based upon the physical and sociological characteristics of any given homogeneous area and serves as a management objective.

Class I areas (preservation) provide for natural ecological changes only. This class includes primitive areas, some natural areas, some wild and scenic rivers and other similar sites where landscape modification activities should be restricted.

Class II (retention of the landscape character) includes areas where changes in any of the basic elements (form, line, color or texture) caused by management activity should not be evident in the characteristic landscape.

Class III (partial retention of the landscape character) includes areas where changes in the basic elements (form, line, color or texture) caused by management activity may be evident in the characteristic landscape. However, the changes should remain subordinate to the visual strength of the existing character.

Class IV (modification of the landscape character) includes areas where changes may subordinate the original composition and character; however, they should reflect what could be a natural occurrence within the characteristic landscape.

Class V (rehabilitation or enhancement of the landscape character) includes areas where change is needed. This class applies to areas where the landscape character has been so disturbed that rehabilitation is needed. This class would apply to areas where the quality class has been reduced because of unacceptable intrusions. It should be considered an interim short-term classification until one of the other classes can be reached through rehabilitation or enhancement.

Water Quality — The chemical, physical and biological characteristics of water with respect to its suitability for a particular use.

Watershed — All lands which are enclosed by a continuous hydrologic drainage divide and lie upslope from a specified point on a stream.

Watershed Cover — The material (vegetation, litter, rock) covering the soil and providing protection from, or resistance to, the impact of raindrops and the energy of overland flow, and expressed in percent of the area covered.

Wetlands — Permanently wet or intermittently flooded areas where the water table (fresh, saline or brackish) is at, near or above the soil surface for extended intervals, where hydric wet soil conditions are normally exhibited and where water depths generally do not exceed two meters.

Wilderness Study Area (WSA) — An area determined to have wilderness characteristics. Study areas will be subject to interdisciplinary analysis and public comment to determine wilderness suitability. Suitable areas will be recommended to the President and Congress for wilderness designation.

Woodland — A forest community occupied primarily by noncommercial species; e.g., juniper, Mountain mahogany or aspen groves.

Wolfplant — A plant that, though the species is considered palatable, is not grazed by livestock. The term "wolfy" is often used to describe this condition which is common on under-utilized crested wheatgrass seedings.

Acronyms

ACEC: Area of Critical Environmental Concern
AMP: Allotment Management Plan
AU: Animal Unit
AUM: Animal Unit Month
BLM: Bureau of Land Management
BFMP: Best Forest Management Practices
BPA: Bonneville Power Administration
CEQ: Council of Environmental Quality
CFL: Commercial Forest Land
CFR: Code of Federal Regulations
CRMP: Coordinated Resource Management Plan
DEQ: Department of Environmental Quality
EIS: Environmental Impact Statement
FLPMA: Federal Land Policy and Management Act
FY: Fiscal Year -- 10/1 to 9/30
GEM: Geology-Energy-Minerals
HMA: Herd Management Area
HMP: Habitat Management Plan
IM-OR: Instruction Memorandum -- Oregon (BLM)
IM-WO: Instruction Memorandum -- Washington, D.C. (BLM)
MCHMA: Murderer's Creek Herd Management Area
MFP: Management Framework Plan
M.S.A.: Management Situation Analysis
NEPA: National Environmental Policy Act
NRHP: National Register of Historic Places
NPS: National Park Service
OAESIS: Oregon Automated Ecological Site Information System
ODF&W: Oregon Department of Fish and Wildlife
ORV: Off-Road Vehicle
R&PP: Recreation and Public Purposes Act
RNA: Research Natural Area
RMP: Resource Management Plan
SCS: Soil Conservation Service
SHPO: State Historical Preservation Officer
SWCC: Soil and Water Conservation Commission
TPCC: Timber Production Capability Classification
USDA: U.S. Department of Agriculture
USDI: U.S. Department of Interior
USFS: U.S. Forest Service
USFWS: U.S. Fish and Wildlife Service
VRM: Visual Resource Management
WMU: Wildlife Management Unit
WSA: Wilderness Study Area

Appendices



Appendix A

Opportunities for Disposal of Public Lands Under Alternative D
 State: Oregon
 District Office: Burns
 County: Grant
 As Of: March 25, 1983

Willamette Meridian

Legal Description	Total	Legal Description	Total
T. 9. S., R. 26 E.,			
sec. 1, lots 1, 2, S $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$;	179.09	sec. 12, SW $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$;	240.00
sec. 3, lots 3, 4, SW $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$;	172.77	sec. 13, N $\frac{1}{2}$ NW $\frac{1}{4}$;	80.00
sec. 4, S $\frac{1}{2}$ SW $\frac{1}{4}$;	80.00	sec. 17, W $\frac{1}{2}$ NW $\frac{1}{4}$.	80.00
sec. 8, NE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$;	280.00		881.38
sec. 9, NE $\frac{1}{4}$, S $\frac{1}{2}$;	480.00		
sec. 10, E $\frac{1}{2}$, E $\frac{1}{2}$ SW $\frac{1}{4}$;	400.00	T. 7 S., R. 27 E.,	
sec. 11, SW $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$;	200.00	sec. 10, E $\frac{1}{2}$ SW $\frac{1}{4}$;	80.00
sec. 14, N $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$;	160.00	sec. 13, SE $\frac{1}{4}$ NW $\frac{1}{4}$;	40.00
sec. 15, NE $\frac{1}{4}$ NE $\frac{1}{4}$;	40.00	sec. 15, W $\frac{1}{2}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$;	160.00
sec. 17, N $\frac{1}{2}$, N $\frac{1}{2}$ S $\frac{1}{2}$, S $\frac{1}{2}$ SW $\frac{1}{4}$;	560.00	sec. 21, SE $\frac{1}{4}$;	160.00
sec. 18, S $\frac{1}{2}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$;	320.00	sec. 22, S $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$;	120.00
sec. 19, lots 1, 2, 3, 4, NE $\frac{1}{4}$, E $\frac{1}{2}$ W $\frac{1}{2}$, W $\frac{1}{2}$ SE $\frac{1}{4}$;	600.00	sec. 23, N $\frac{1}{2}$ NW $\frac{1}{4}$;	80.00
sec. 21, SW $\frac{1}{4}$ NW $\frac{1}{4}$;	40.00	sec. 24, NW $\frac{1}{4}$ SE $\frac{1}{4}$;	40.00
sec. 22, S $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$;	240.00	sec. 26, SW $\frac{1}{4}$ NW $\frac{1}{4}$;	40.00
sec. 23, W $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$;	440.00	sec. 28, E $\frac{1}{2}$ NE $\frac{1}{4}$.	80.00
sec. 24, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$;	200.00		800.00
sec. 25, NW $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$;	440.00	T. 8 S., R. 27 E.,	
sec. 16, NE $\frac{1}{4}$;	160.00	sec. 15, W $\frac{1}{2}$ SW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$;	160.00
sec. 27, SE $\frac{1}{4}$ SE $\frac{1}{4}$;	40.00	sec. 29, N $\frac{1}{2}$ SW $\frac{1}{4}$;	80.00
sec. 28, E $\frac{1}{2}$ W $\frac{1}{2}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$;	200.00	sec. 32, W $\frac{1}{2}$ SW $\frac{1}{4}$.	80.00
sec. 29, NW $\frac{1}{4}$ NE $\frac{1}{4}$;	40.00		320.00
sec. 30, lot 1, E $\frac{1}{2}$ NW $\frac{1}{4}$.	121.06	T. 9 S., R. 27 E.,	
	5,392.92	sec. 5, E $\frac{1}{2}$ NE $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$;	160.00
T. 10 S., R. 26 E.,		sec. 6, lots 4, 5, 6, SW $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$;	270.82
sec. 6, lots 4 thru 7 inclusive;	164.59	sec. 18, S $\frac{1}{2}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$;	200.00
sec. 7, lot 1, W $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$;	160.69	sec. 19, NE $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$;	240.00
sec. 8, N $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$;	240.00	sec. 30, NW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$.	80.00
sec. 30, lot 1, E $\frac{1}{2}$, E $\frac{1}{2}$ W $\frac{1}{2}$.	519.45		950.82
	1,084.73		
T. 17 S., R. 26 E.,		T. 10 S., R. 27 E.,	
sec. 13, NE $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$;	160.00	sec. 1, lot 1, SE $\frac{1}{4}$ NE $\frac{1}{4}$;	80.00
sec. 20, NW $\frac{1}{4}$ SE $\frac{1}{4}$;	40.00	sec. 10, W $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$;	160.00
sec. 22, SE $\frac{1}{4}$ NW $\frac{1}{4}$;	40.00	sec. 14, NE $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$;	80.00
sec. 25, NE $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$;	120.00	sec. 15, W $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$;	120.00
sec. 29, SE $\frac{1}{4}$ NE $\frac{1}{4}$, W $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$;	200.00	sec. 21, W $\frac{1}{2}$ NW $\frac{1}{4}$.	80.00
sec. 30, SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$;	160.00		520.00
sec. 31, W $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$;	160.00	T. 12 S., R. 27 E.,	
sec. 32, NW $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$;	120.00	sec. 15, NE $\frac{1}{4}$ NE $\frac{1}{4}$;	40.00
sec. 35, SE $\frac{1}{4}$.	160.00	sec. 16, NW $\frac{1}{4}$ NW $\frac{1}{4}$;	40.00
	1,160.00	sec. 26, W $\frac{1}{2}$ E $\frac{1}{2}$, W $\frac{1}{2}$;	480.00
T. 18 S., R. 26 E.,		sec. 28, W $\frac{1}{2}$ NE $\frac{1}{4}$, W $\frac{1}{2}$;	400.00
sec. 1, S $\frac{1}{2}$ SE $\frac{1}{4}$;	80.00	sec. 34, all.	640.00
sec. 2, lots 1, 2, S $\frac{1}{2}$ NE $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$;	241.12		1,600.00
sec. 4, SE $\frac{1}{4}$ SW $\frac{1}{4}$;	40.00		
sec. 5, lot 4;	40.26		
sec. 8, NE $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$;	80.00		

Legal Description**Total****T. 13 S., R. 27 E.,**

sec. 2, lots 1 thru 4 inclusive, S $\frac{1}{2}$ N $\frac{1}{2}$, SE $\frac{1}{4}$;	480.00
sec. 12, SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$;	80.00
sec. 18, lots 3, 4.	82.80
	<hr/> 642.80

T. 17 S., R. 27 E.,

sec. 8, NE $\frac{1}{4}$ NE $\frac{1}{4}$, W $\frac{1}{2}$ E $\frac{1}{2}$;	200.00
sec. 9, E $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$;	360.00
sec. 10, N $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$;	200.00
sec. 11, NW $\frac{1}{4}$ NW $\frac{1}{4}$;	40.00
sec. 13, NW $\frac{1}{4}$ NE $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$;	120.00
sec. 15, E $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$;	440.00
sec. 17, NW $\frac{1}{4}$ NE $\frac{1}{4}$;	40.00
sec. 18, lot 3;	40.49
sec. 21, W $\frac{1}{2}$ E $\frac{1}{2}$;	160.00
sec. 22, W $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$;	120.00
sec. 23, N $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$;	320.00
sec. 24, SW $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$;	120.00
sec. 25, SW $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$;	160.00
sec. 26, NE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$;	80.00
sec. 27, SW $\frac{1}{4}$;	160.00
sec. 28, E $\frac{1}{2}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$;	360.00
sec. 29, E $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$;	120.00
sec. 30, lots 2, 3, 4;	121.08
sec. 31, lots 1 thru 4 inclusive;	161.22
sec. 33, E $\frac{1}{2}$, NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$;	560.00
sec. 34, W $\frac{1}{2}$, S $\frac{1}{2}$ SE $\frac{1}{4}$.	400.00
	<hr/> 4,282.79

T. 18 S., R. 27 E.,

sec. 2, SW $\frac{1}{4}$ SW $\frac{1}{4}$;	40.00
sec. 3, lots 3, 4, S $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$;	327.16
sec. 4, lots 1, 2, 3, 4, NE $\frac{1}{2}$ SE $\frac{1}{4}$;	212.26
sec. 5, lots 3, 4, S $\frac{1}{2}$ SE $\frac{1}{4}$;	164.24
sec. 6, SE $\frac{1}{4}$ SE $\frac{1}{4}$;	40.00
sec. 8, NE $\frac{1}{4}$, N $\frac{1}{2}$ S $\frac{1}{2}$;	480.00
sec. 9, SE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$;	80.00
sec. 10, N $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$;	160.00
sec. 11, S $\frac{1}{2}$ NE $\frac{1}{4}$;	80.00
sec. 12, S $\frac{1}{2}$ N $\frac{1}{2}$.	160.00
	<hr/> 1,743.66

T. 7 S., R. 28 E.,

sec. 1, NE $\frac{1}{4}$ SW $\frac{1}{4}$;	40.00
sec. 8, NW $\frac{1}{4}$ SW $\frac{1}{4}$;	40.00
sec. 10, SW $\frac{1}{4}$ SE $\frac{1}{4}$;	40.00
sec. 12, NE $\frac{1}{4}$ NE $\frac{1}{4}$;	40.00
sec. 15, SE $\frac{1}{4}$ SE $\frac{1}{4}$;	40.00
sec. 17, SE $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$;	200.00
sec. 26, SE $\frac{1}{4}$ NW $\frac{1}{4}$;	40.00
sec. 29, SW $\frac{1}{4}$ SW $\frac{1}{4}$;	40.00
sec. 30, lot 7, SE $\frac{1}{4}$ SE $\frac{1}{4}$.	80.00
	<hr/> 560.00

T. 8 S., R. 28 E.,

sec. 14, NW $\frac{1}{4}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$;	80.00
sec. 15, E $\frac{1}{2}$ SW $\frac{1}{4}$;	80.00
sec. 22, NE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$;	120.00
sec. 23, E $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$;	160.00
sec. 24, W $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$;	120.00
sec. 26, SW $\frac{1}{4}$ SE $\frac{1}{4}$;	40.00
sec. 27, SW $\frac{1}{4}$ SE $\frac{1}{4}$;	40.00
sec. 28, N $\frac{1}{2}$ SW $\frac{1}{4}$.	80.00
	<hr/> 720.00

Legal Description**Total****T. 9 S., R. 28 E.,**

sec. 3, lot 4;	36.32
sec. 4, SW $\frac{1}{4}$ NE $\frac{1}{4}$;	40.00
sec. 6, lots 1, 2, 3, 6, 7, SW $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$;	293.42
sec. 7, W $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$;	120.00
sec. 8, SW $\frac{1}{4}$ SW $\frac{1}{4}$;	40.00
sec. 9, SE $\frac{1}{4}$ SW $\frac{1}{4}$;	40.00
sec. 17, SW $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$;	120.00
sec. 18, SE $\frac{1}{4}$ SE $\frac{1}{4}$;	40.00
sec. 20, SW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$;	160.00
sec. 22, E $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$;	120.00
sec. 27, SW $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$;	120.00
sec. 28, S $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$;	120.00
sec. 29, W $\frac{1}{2}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$;	440.00
sec. 30, SE $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$;	120.00
sec. 31, N $\frac{1}{2}$ N $\frac{1}{2}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$;	240.00
sec. 34, NW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$.	80.00
	<hr/> 2,129.74

T. 10 S., R. 28 E.,

sec. 7, NE $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$;	80.00
sec. 16, SW $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$;	160.00
sec. 33, NW $\frac{1}{4}$ SE $\frac{1}{4}$.	40.00
	<hr/> 280.00

T. 12 S., R. 28 E.,

sec. 14, SW $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$;	160.00
sec. 15, NE $\frac{1}{4}$;	160.00
sec. 24, N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$.	160.00
	<hr/> 480.00

T. 13 S., R. 28 E.,

sec. 14, N $\frac{1}{2}$;	320.00
sec. 17, SE $\frac{1}{4}$;	160.00
sec. 18, lots 3, 4;	109.71
sec. 19, lot 1, E $\frac{1}{2}$ NE $\frac{1}{4}$;	134.87
sec. 20, N $\frac{1}{2}$ N $\frac{1}{2}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$;	240.00
sec. 22, S $\frac{1}{2}$ SE $\frac{1}{4}$;	80.00
sec. 24, NE $\frac{1}{4}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$;	80.00
sec. 34, NW $\frac{1}{4}$ NE $\frac{1}{4}$.	40.00
	<hr/> 1,164.58

T. 17 S., R. 28 E.,

sec. 33, SE $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$;	120.00
sec. 35, E $\frac{1}{2}$ SE $\frac{1}{4}$.	80.00
	<hr/> 200.00

T. 18 S., R. 28 E.,

sec. 2, lot 1;	45.18
sec. 3, W $\frac{1}{2}$ SW $\frac{1}{4}$;	80.00
sec. 4, lot 2, S $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$;	174.81
sec. 5, lot 1, S $\frac{1}{2}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$;	257.66
sec. 6, lots 1 thru 7 inclusive, S $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$;	531.03
sec. 7, S $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$;	240.00
sec. 8, W $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$;	480.00
sec. 9, S $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$;	200.00
sec. 10, W $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$;	120.00
sec. 11, SE $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$;	160.00
sec. 12, SE $\frac{1}{4}$;	160.00
sec. 14, SW $\frac{1}{4}$ SW $\frac{1}{4}$;	40.00
sec. 15, S $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$;	160.00
sec. 17, NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$;	560.00
sec. 20, N $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$;	120.00

Legal Description	Total	Legal Description	Total
sec. 21, NE $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$;	80.00	T. 12 S., R. 30 E.,	
sec. 22, S $\frac{1}{2}$ SW $\frac{1}{4}$;	80.00	sec. 25, SE $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$;	80.00
sec. 23, NW $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$;	200.00	sec. 34, W $\frac{1}{2}$ W $\frac{1}{2}$.	160.00
sec. 24, W $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$;	200.00		240.00
sec. 27, all;	640.00		
sec. 28, SW $\frac{1}{4}$ NE $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$;	160.00	T. 13 S., R. 30 E.,	
sec. 33, E $\frac{1}{2}$ E $\frac{1}{2}$.	160.00	sec. 4, SE $\frac{1}{4}$ SE $\frac{1}{4}$;	40.00
	4,848.68	sec. 6, lots 1 thru 4 inclusive;	161.98
T. 8 S., R. 29 E.,		sec. 14, NW $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$;	160.00
sec. 5, SW $\frac{1}{4}$ NW $\frac{1}{4}$;	40.00	sec. 18, lots 1, 2, E $\frac{1}{2}$, E $\frac{1}{2}$ NW $\frac{1}{4}$.	482.75
sec. 18, lot 15;	40.00		844.73
sec. 22, SW $\frac{1}{4}$ SE $\frac{1}{4}$;	40.00	T. 14 S., R. 30 E.,	
sec. 27, NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$;	280.00	sec. 3, NW $\frac{1}{4}$ SW $\frac{1}{4}$;	40.00
sec. 35, NE $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$.	80.00	sec. 7, E $\frac{1}{2}$ NE $\frac{1}{4}$;	80.00
	480.00	sec. 11, NW $\frac{1}{4}$ SE $\frac{1}{4}$.	40.00
T. 9 S., R. 29 E.,			160.00
sec. 30, N $\frac{1}{2}$ SE $\frac{1}{4}$;	80.00	T. 8 S., R. 31 E.,	
sec. 31, lot 3, SW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$.	163.39	sec. 32, NE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$.	80.00
	243.39	T. 9 S., R. 31 E.,	
T. 10 S., R. 29 E.,		sec. 8, NW $\frac{1}{4}$ SE $\frac{1}{4}$;	40.00
sec. 1, SE $\frac{1}{4}$ NE $\frac{1}{4}$;	40.00	sec. 12, SE $\frac{1}{4}$ SE $\frac{1}{4}$;	40.00
sec. 13, SW $\frac{1}{4}$ NW $\frac{1}{4}$;	40.00	sec. 15, SE $\frac{1}{4}$ SE $\frac{1}{4}$.	40.00
sec. 14, SE $\frac{1}{4}$ NE $\frac{1}{4}$.	40.00		120.00
	120.00	T. 12 S., R. 31 E.,	
T. 11 S., R. 29 E.,		sec. 26, SW $\frac{1}{4}$ SE $\frac{1}{4}$;	40.00
sec. 29, SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$;	200.00	sec. 30, lots 2, 3, 4, SE $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$.	329.31
sec. 30, lot 3 NW $\frac{1}{4}$ NE $\frac{1}{4}$;	82.31		369.31
sec. 32, NW $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$.	80.00	T. 13 S., R. 31 E.,	
	362.31	sec. 4, NE $\frac{1}{4}$ SW $\frac{1}{4}$;	40.00
T. 12 S., R. 29 E.,		sec. 6, lot 1.	40.06
sec. 17, S $\frac{1}{2}$ N $\frac{1}{2}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$;	200.00		80.06
sec. 18, lots 2, 3, S $\frac{1}{2}$ SE $\frac{1}{4}$;	160.00	T. 9 S., R. 32 E.,	
sec. 20, NW $\frac{1}{4}$ NE $\frac{1}{4}$;	40.00	sec. 22, NW $\frac{1}{4}$ SW $\frac{1}{4}$.	40.00
sec. 28, E $\frac{1}{2}$ NW $\frac{1}{4}$;	80.00	T. 12 S., R. 32 E.,	
sec. 34, W $\frac{1}{2}$ SW $\frac{1}{4}$.	80.00	sec. 26, NW $\frac{1}{4}$;	160.00
	560.00	sec. 28, N $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$;	120.00
T. 13 S., R. 29 E.,		sec. 30, SW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$;	120.00
sec. 6, lots 3, 4, 5, 6, 7, SE $\frac{1}{4}$ NW $\frac{1}{4}$;	242.25	sec. 32, NW $\frac{1}{4}$ SW $\frac{1}{4}$.	40.00
sec. 8, all;	640.00		440.00
sec. 24, NE $\frac{1}{4}$, W $\frac{1}{2}$ NW $\frac{1}{4}$;	240.00	T. 13 S., R. 32 E.,	
sec. 28, W $\frac{1}{2}$ SW $\frac{1}{4}$.	80.00	sec. 8, SE $\frac{1}{4}$ SE $\frac{1}{4}$.	40.00
	1,202.25	T. 14 S., R. 32 E.,	
T. 14 S., R. 29 E.,		sec. 4, NW $\frac{1}{4}$ SE $\frac{1}{4}$;	40.00
sec. 11, E $\frac{1}{2}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ S $\frac{1}{2}$.	240.00	sec. 10, NW $\frac{1}{4}$ NE $\frac{1}{4}$;	40.00
T. 17 S., R. 29 E.,		sec. 12, SW $\frac{1}{4}$ NW $\frac{1}{4}$.	40.00
sec. 6, lot 3;	39.37		120.00
sec. 19, SE $\frac{1}{4}$ NE $\frac{1}{4}$.	40.00	T. 12 S., R. 33 E.,	
	79.37	sec. 20, SE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$;	120.00
T. 18 S., R. 29 E.,		sec. 30, S $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$.	240.00
sec. 19, lot 3.	35.18		360.00
T. 8 S., R. 30 E.,		T. 13 S., R. 33 E.,	
sec. 12, SE $\frac{1}{4}$ NW $\frac{1}{4}$;	40.00	sec. 6, lot 2, SW $\frac{1}{4}$ NE $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$;	160.56
sec. 14, NE $\frac{1}{4}$ NE $\frac{1}{4}$;	40.00	sec. 8, NW $\frac{1}{4}$;	160.00
sec. 17, NE $\frac{1}{4}$ NW $\frac{1}{4}$;	40.00	sec. 22, NE $\frac{1}{4}$ NE $\frac{1}{4}$.	40.00
sec. 30, SW $\frac{1}{4}$ NW $\frac{1}{4}$.	40.00		360.56
	160.00		

T. 12 S., R. 34 E.,	
sec. 27, SE $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$;	80.00
sec. 34, NW $\frac{1}{4}$ SE $\frac{1}{4}$.	40.00
	<hr/> 120.00
T. 13 S., R. 34 E.,	
sec. 24, SE $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$.	160.00
Total	<hr/> 36,779.26

Acreage slightly reduced since publication of proposed land use alternatives due to elimination of tracts within WSAs and of tracts within mining claims.

Appendix B

Range Developments

The following is a discussion of typical design features and construction (see Table B-1 or 4-3 for a summary of improvements and treatments). There are many special design features that can be made part of a project's design, that are not specifically discussed in this Appendix. One example of a special design feature would be the use of a specific color of fence post to blend with the surrounding environment and thereby mitigate some of the visual impact of the fence. These mitigating design features will be developed, if needed, for individual projects at the time an environmental analysis is completed.

Structural Improvements

Fences

Fences would be constructed to provide exterior allotment boundaries, divide allotments into pastures, protect streams, and control livestock. Most fences would be three or four wire with steel posts with intermediate wire stays. Existing fences that create wildlife movement problems would be modified. Proposed fence lines would not be bladed or scraped. Gates or cattleguards (gates with cattleguards) would be installed where fences cross existing roads. For any fences in wildlife migration areas, the need for let-down fences to allow passage of wildlife would be analyzed. These fences would be let down when livestock are not present.

Water Impoundments

Reservoirs, including dugouts and waterholes, and catchments would be constructed with earth-moving machinery. The essential steps in constructing a dam for a reservoir are the excavation of a keyway, backfilling a core of non-permeable material and placing other fill to a prescribed height and slope. Generally, all fill material is excavated on-site. Dugouts are very small reservoirs whose dams do

not have a keyway and core. Depending upon feasibility, some reservoirs with a fill of over 15 feet would be fenced and water piped to a trough or waterhole. Waterholes are excavated holes in non-permeable material with the spoil placed adjacent to the hole. Catchments are rainfall catching projects consisting of a fenced watershed apron and a impermeable waterhole, bag, tank or trough. Catchments may have large aprons for livestock or very small ones for wildlife guzzlers.

Spring Development

Springs would be developed or redeveloped using a backhoe to install a buried collection system, usually consisting of drain tile or perforated pipe and a collection box. A short pipeline could be installed to deliver water to a trough for use by livestock and wildlife. Ramps, rocks, or floatboards would be provided in all water troughs for small birds and mammals to gain access to and/or escape from the water. Normally the spring area and the overflow are fenced to exclude livestock following development.

New spring developments and new reservoirs would cause a permanent decrease in upland key species composition on 5 to 10 acres surrounding the new water source due to heavy utilization and trampling by livestock concentrating in the area. As springs are developed, water would be diverted to livestock water troughs and fencing would protect riparian vegetation where significant overflow occurs. Consequently, a new increase would occur over the long term in both woody and herbaceous riparian key species at springs.

Pipelines

Wherever possible, water pipelines would be buried. Most pipelines would have water troughs and sometimes storage tanks.

Wells

Well sites would be selected based on geologic reports that predict the depth to reliable aquifers. All applicable state laws and regulations that apply to the development of ground water would be observed.

Nonstructural Improvements

Vegetation Manipulation

Vegetation manipulation (brush control and brush control with seeding) is proposed primarily in portions of the big sagebrush vegetation type where significant improvement in the range condition rating would require more than 15 years using grazing management alone.

Vegetation manipulation projects would be design-

ed using irregular patterns, untreated patches, etc., to provide for optimum edge effect for visual and wildlife considerations. Layout and design would be coordinated with Oregon Department of Fish and Wildlife biologists.

Burning

The proposed methods of brush and juniper control are burning, chainsawing, chaining or plowing. Burning would temporarily reduce sagebrush because sagebrush does not resprout following fire. The effect of burning on perennial bunchgrasses varies with the intensity of the fire, season of the burn and the species of grass in the burn area. The composition of Sandberg's bluegrass, bluebunch wheatgrass, cheatgrass and squirreltail, where present, would increase on areas proposed for burning. Several studies in Idaho indicate that fall burning does not harm most perennial herbaceous species (Britton 1978).

Seeding

Seeding would be accomplished by use of the rangeland drill in most cases. Broadcast seeding would occur on small disturbed areas, rough terrain and rocky areas. Preparation for seeding (brush control) would be by burning or mechanical treatment. Based on observations of existing seedings in the RMP area and studies of similar areas in Oregon, crested wheatgrass would comprise 50 to 90 percent of the seeded area. Species composition following any treatment would vary according to the success of the brush control, the survival of other species in the seed mixture and the amount of precipitation in the year following seeding.

It is anticipated that the existing road and trail system would provide access for range improvement construction.

It is assumed that normal maintenance such as replacement of pipeline sections, fence posts and retreatment of vegetation manipulations would occur.

Standard Operating Procedures

The following procedures would be followed in the construction of all management facilities and for vegetation manipulations.

1. Specific proposed projects would be evaluated individually through the analysis process to determine whether they would have significant adverse environmental impacts.
2. Roads or trails to new construction or project sites would not normally be constructed. Use of existing roads and trails would be encouraged.
3. To comply with the National Historic Preservation

Act of 1966, 36 CFR 800, and Executive Order 11593, all areas where ground is to be disturbed by range developments would be inventoried for prehistoric and historic features. Where feasible, all sites found by this inventory would be avoided.

If sites are found to be eligible for the national register and cannot be avoided, a determination of the effect of the project on the site(s), including appropriate mitigating measures if necessary, would be done in consultation with the State Historic Preservation Officer and the Advisory Council on Historic Preservation. No action affecting the site would be taken until the Advisory Council and SHPO has had the opportunity to make comments.

If buried cultural remains are encountered during construction, the operator must discontinue construction until the BLM evaluates the discovery and determines the appropriate action.

4. No action would be taken by the BLM that could jeopardize the continued existence of any federally listed threatened or endangered plant or animal species. An endangered species clearance with the U. S. Fish and Wildlife Service (FWS) would be required before any part of the Preferred Alternative or other alternatives would be implemented that could affect an endangered species or its habitat.

In situations where data are insufficient to make an assessment of proposed actions, surveys of potential habitats would be made before a decision is made to take any action that could affect threatened or endangered species. Should the BLM determine that there could be an effect on a federally listed species, formal consultation with the FWS would be initiated. In the interim period before formal consultation, the BLM would not take any action that would make an irreversible or irretrievable commitment of resources that would foreclose the consideration of modifications or alternatives to the proposed action. When the FWS opinion is received, if it should indicate the action would be likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat, the action would be abandoned or altered as necessary.

The BLM also would comply with any state laws applying to animal or plant species identified by the state as being threatened or endangered (in addition to the federally listed species).

5. All actions would be consistent with the BLM's Visual Resource Management criteria. The management criteria for the specific Visual Class would be followed.
6. Wildlife escape devices would be installed and maintained in water troughs.
7. In crucial wildlife habitat (winter ranges, fawn-

ing/calving areas, strutting grounds, etc.), construction work on projects would be scheduled during seasons when the animals are not concentrated to avoid or minimize disturbances.

8. Surface disturbance at all project sites would be held to a minimum. Disturbed soil would be rehabilitated to blend into the surrounding soil surface and reseeded as needed with a mixture of grasses, forbs and browse as applicable to replace ground cover and reduce soil loss from wind and water erosion.

9. Analysis of cost effectiveness would be done on an Allotment Management Plan (AMP) basis prior to the installation of any management facility or land treatment.

10. Generally all areas where vegetative manipulations occur would be totally rested from grazing during at least two growing seasons following treatment.

11. Vegetative manipulation projects would be done in irregular patterns creating more edge (more than strip and block manipulation), with islands of vegetation left for cover.

12. All land treatment projects on crucial wildlife ranges would be limited in size, where appropriate, by the cover requirements of wildlife.

Table B-1 Range Improvements by Allotment (I Category Allotments Only)*

Preferred Alternative

Allot. No.	Seeding (Acres)	Brush Control (Acres)	Fence (Mi.)	Spring Devel.	Pipe-line	Reservoirs	Cattle-guards
4007	155	600	1.01	2	0	1	0
4049	0	700	3.0	3	0	4	0
4052	0	400	6.5	12	0	7	0
4068	300	600	2.0	2	0	4	0
4086	0	0	0	2	0	6	0
4097	300	460	0.5	3	0	1	0
4098	200	200	0.5	0	0	1	0
4103	100	280	6.3	2	0	7	0
4120	570	950	0	1	2	4	0
4124	280	200	2.5	1	0	3	0
4151	0	0	0	0	0	0	0
4156	0	0	1.2	1	0	0	0
4163	0	0	0	0	0	0	0
4164	0	0	3.0	0	0	0	0
Total	1905	4390	26.5	29	2	40	0

* Brush Control acres, for the most part, overlap Seeding acres.

Production Alternative

Seeding (Acres)	Brush Control (Acres)	Fence (Mi.)	Spring Devel.	Pipe-line	Reservoirs	Cattle-guards
365	960	1.0	2	2	1	0
120	1130	3.0	3	0	4	0
0	700	6.5	12	0	7	0
300	600	2.0	2	0	4	0
0	150	0	2	0	6	0
300	460	0.5	3	0	1	0
200	200	0.5	0	0	1	0
100	280	6.3	2	0	7	1
570	950	0	1	2	4	0
280	200	2.5	1	0	3	0
0	200	0	0	0	0	1
0	480	1.2	1	0	0	0
0	200	0	0	0	2	0
0	0	3.0	0	0	0	0
2235	6510	26.5	29	2	40	2

Enhancement Alternative

Seeding (Acres)	Brush Control (Acres)	Fence (Mi.)	Spring Devel.	Pipe-line	Reservoirs	Cattle-guards
0	300	0	0	0	0	0
0	700	0	3	0	0	0
0	0	6.5	12	0	7	0
0	200	2.0	0	0	2	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	1	0
0	0	4.3	2	0	7	0
0	0	0	0	0	0	0
0	0	0	0	0	1	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	1200	12.8	17	0	18	0

No Action Alternative

Seeding (Acres)	Brush Control (Acres)	Fence (Mi.)	Spring Devel.	Pipe-line	Reservoirs	Cattle-guards
185	780	1.0	1	0	0	0
0	0	1.2	3	0	1	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	1.3	0	0	1	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	4.3	1	0	1	0
415	345	0	0	2	1	0
250	0	1.2	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
850	1125	9.0	5	2	4	0

Appendix C

Grazing Treatments - Systems

Treatments

Early Grazing - grazing occurs for 1-2 months prior to the beginning of the critical growth period. Livestock are utilizing primarily the previous year's growth although some use of the early green growth occurs.

Growing Season Grazing - grazing occurs during the critical growing period, generally between May 1 and seedripeness for key grass species.

Deferred Grazing - grazing occurs after seedripeness and may include any part of the period until growth begins in the spring.

Rest - No grazing during the grazing season. This excludes any of the above treatments.

Systems

Grazing systems may include any or all of the treatments in various combinations to accomplish specific objectives.

Grazing Systems

A grazing system consists of one or more planned livestock grazing treatments which bring about changes in or maintenance of the composition of key species. Key species are those plants which serve as indicators of objective accomplishment in the vegetation communities. Grazing systems which allow plants to complete the growth stages generally result in increases in, or maintenance of, key species. See Table C-1 for approximate growth stage dates for upland key species. (Growth stage dates for riparian key species were not a major part of the rationale for grazing system design.) In the RMP area, the critical part of the growing season normally occurs from May 1 to August 15, depending on the elevation. In general, plant growth is delayed 10 days for every 1,000 feet rise in elevation.

Although each of the following descriptions outlines the typical period of grazing use, there is some variation among the different allotments. Figure C-1 shows examples of the proposed systems with sequence of treatments.

Early Spring Grazing System (EA) - Grazing occurs for one to two months prior to the start of the critical growing period under this system. Early spring grazing maximizes use of grasses that are not as palatable later in the season, such as cheatgrass and Sandberg's bluegrass, and also utilizes the previous years growth of perennial

plants. Because grazing ceases while adequate soil moisture is available, most perennial plants are able to produce seed and replenish most carbohydrate reserves. Early spring grazing would permit seedling establishment (Stoddart et al. 1975) and an increase in key upland herbaceous species composition is expected under this system.

Light utilization on key upland woody species is expected under early spring grazing. Consequently, a long term increase in composition of these species would occur in areas where a potential for increase exists because plant vigor and reproduction would be maintained.

Key woody and herbaceous riparian vegetation would increase in composition under this system. Better distribution of livestock because of cool weather, abundant green upland forage and more water sources would lessen use on riparian vegetation. Regrowth after grazing would occur because of adequate soil moisture in the riparian areas.

Spring/Summer Grazing System (SS) - Grazing occurs every year during the critical part of the growing season under this system. Although the proposed stocking rates are designed to achieve moderate levels of utilization on most areas, factors such as terrain, location of fences and water, and the type of vegetation often prevent uniform patterns of grazing. Heavy grazing inevitably would occur on some portions of an allotment and light use would occur in other areas. A decrease in native, key upland herbaceous and woody species is expected on those areas within an allotment that receive heavy utilization -- primarily areas adjacent to water developments, riparian areas and flat valley bottoms. Spring/summer grazing at the Squaw Butte Experiment Station, where stocking rates were designed to achieve a moderate level of grazing use, resulted in heavy utilization of 37 percent of the range. Over an 11-year period, this produced a change in species composition toward dominance by less palatable species such as Sandberg's bluegrass (Hyder 1951). Most researchers (e.g., Hyder 1951) agree that heavy use levels under a spring/summer system result in lowered vigor and a decrease in composition of most key herbaceous and woody upland plants. Moderate grazing levels may somewhat reduce plant vigor, but the composition of most key species would be maintained. Although this is not the most desirable system for native key species, crested wheatgrass can perpetuate itself under a slightly modified spring/summer grazing system. Research indicates that crested wheatgrass produces more photosynthetic tissue per unit volume of vegetation than bluebunch wheatgrass and can replenish root reserves much more rapidly than native grasses (Miller 1983). Miller also found that if grazing does not take place until after May 15, crested wheatgrass will store adequate root reserves to retain vigor through the grazing period. Therefore,

the spring/summer system is proposed mostly for use on seeded pastures.

Decreases in key woody and herbaceous species are expected to occur in riparian areas that are accessible to livestock under spring/summer grazing. Livestock prefer green forage. Consequently, as upland herbaceous species become dry in late summer livestock begin grazing green herbaceous and woody species in accessible riparian areas, and heavy utilization generally occurs.

Deferred Grazing System (DF) - The deferred system allows grazing after most of the upland herbaceous key species have reached seedripeness stage and replenished carbohydrate reserves. The composition of key upland herbaceous species such as Idaho fescue and bluebunch wheatgrass would increase.

Moderate utilization of upland woody species encourages growth of additional twigs and therefore increases forage production. Reproductive capacity, on the other hand, is slightly decreased over the years because increased twig growth reduces the development of flowers and fruits, but long-term composition is not expected to change (Garrison 1953 Cited by Stoddart, Smith and Box 1975, p. 135). Heavy utilization levels under the deferred grazing system would greatly inhibit reproduction and decrease the composition of upland woody key species.

Livestock would concentrate in accessible riparian areas under deferred grazing because of the availability of green forage and water, and hot temperatures in late summer. This concentration results in heavy utilization of riparian herbaceous and woody species. The composition of key woody riparian species would decrease under this system because grazing would occur during the majority of the critical growth period for these species, particularly willow. Herbaceous riparian species composition would not change because deferred grazing would allow sufficient plant growth to sustain root reserves.

Deferred Rotation Grazing System (DR) - Under deferred rotation, one year of grazing use during the critical growing period is alternated with a year of grazing after the seeds of the key herbaceous species ripen and carbohydrate reserves have been stored. At moderate utilization levels this system would allow adequate root storage and an increase in key herbaceous species would occur. Under heavy utilization levels, root storage during the year of deferment would only be adequate to offset depletion that would occur during the year of season-long use, and herbaceous key species composition would not be expected to change. Woody key species composition in upland areas would not change under moderate utilization and would decrease at heavy utilization levels (refer to discus-

sion of deferred grazing).

The composition of woody species in riparian areas would decrease under this system. Concentrations of livestock in riparian areas would result in heavy utilization of woody riparian species during their critical growth period. For herbaceous riparian species, benefits from rest periods would be offset by impacts from the periods of use, and composition would remain unchanged.

Rest Rotation Grazing System (RS) - Rest rotation grazing alternates one or more years of complete rest with other grazing treatments. The length of the rotation cycle and number of grazing treatments depend on the number of pastures in the grazing system. Three rest rotation systems are proposed.

The first type of rest rotation alternates one year of spring/summer grazing with one year of rest. Herbaceous and woody upland species would not change in composition at heavy use levels because the year of rest provides a recovery period from the year of summer long utilization. At light or moderate utilization levels these species would increase in composition. Riparian key species composition would be maintained at existing levels because the heavy utilization made on these plants during summer long grazing would be offset by the year of rest.

The second type of rest rotation (RE) alternates one year of early spring (EA) grazing with one year of rest. This system has the advantages of the early spring grazing treatment and one full year of rest for plant reproduction. No grazing would be done during the critical growing period.

The third rest rotation system (RD) alternates one year of grazing after seedripeness and one year of complete rest. Under this system, upland herbaceous key species would not be grazed during the critical growing period. This would result in improved vigor, increased seed production and seedling establishment, which would increase key species composition.

These are examples of the more simple systems. Various combination of the treatments can be incorporated depending upon the needs of the plants, livestock management, topography, etc.

Exclusions - No authorized grazing is permitted in exclusion areas. Both livestock and wild horses would be excluded. An initial improvement in the vigor of key species would occur because the absence of grazing during the growing season would allow plants to complete vegetative growth and reproduction. Where the potential exists, a rapid increase in riparian woody species is expected during the first five years of exclusion.

Temporary exclusion would exclude livestock grazing for a period of at least 2 years or until resource objectives are achieved. Grazing would then be resumed under a deferred system allowing a maximum of 1 month's use in September. Grazing use would be monitored to ensure that the condition of the resource is maintained at the improved level.

Fenced Federal Range - Fenced Federal Range consists of tracts of public land fenced into pastures, usually with large amounts of private land. Grazing use is authorized for the grazing capacity of the public lands only. Livestock numbers, kind of animals and period of use are most often not restricted. However, actual grazing use usually occurs after the growing season since the use is in conjunction with private land (often crop lands). This generally applies to C category allotments.

Table C-1 Approximate Growth Stage Dates for Key Species ¹

	Start of Growth	Peak of Flowering	Seed Ripe	Dormancy
Bluebunch wheatgrass	03/10	06/05	07/05	08/20
Basin wildrye	03/21	06/15	07/15	08/05
Idaho fescue	03/05	06/05	07/05	08/05
Crested wheatgrass ^{2 3}	02/20	06/05	07/05	08/05
Squirreltail	03/01	05/25	06/25	07/20
Thurber's needlegrass	03/10	05/20	06/20	08/20
Sandberg bluegrass ³	02/20	05/05	06/20	07/05
Bitterbrush ⁴	04/05	05/20	06/20	09/20

¹Average year at the 3,500 feet elevation.

²Key species for seeded areas.

³Key species for deer and antelope spring range.

⁴Key species for deer winter range.

Table C-2 Grazing Systems for I Category Allotments by Alternative

Allot. No.	Past. No.	Allotment Name	Alternatives			No Action
			Preferred	Production	Enhance	
4007		Windy Point				
	01		DR	DR	DR	DR
	02		DR	DR	DR	DR
	03		DR	DR	DR	DR
	04		DR	DR	DR	DR
	05		DR	DR	DR	DR
	06		DR	DR	DR	DR
	07		EA	EA	EA	EA
	7A		EA	EA	EA	EA
	16		EA	EA	EA	EA
4049		Battle Creek				
	01		DR	DR	DR	DR

Allot. No.	Past. No.	Allotment Name	Alternatives			No Action
			Preferred	Production	Enhance	
	02		DR	DR	DR	DR
	03		DR	DR	DR	DR
	04		DR	DR	DR	DR
4052		Big Baldy				
	01		RS	RS	RD	SS
	02		RS	RS	RD	SS
4068		Sheep Gulch				
	01		EA	EA	EA	EA
	02		RS	RS	RS	RS
	03		RS	RS	RS	RS
4086		Rudio Mtn.				
	01		DR	DR	DR	DR
	02		DR	DR	DR	DR
4097		Trout Creek				
	01		DR	DR	DR	DR
	02		DR	DR	DR	DR
4098		E. Cr.-Pine Hill				
	01		RE	RE	RE	SE
	02		RE	RE	RE	SE
	03		RE	RE	RE	SE
4103		Rockpile				
	01		EA	EA	EA	SS
	02		RS	RS	RD	SS
	03		RS	RS	RD	SS
	04		RS	RS	RS	SS
	05		RS	RS	RS	SS
4120		Ferris Creek				
	01		EA	EA	EA	EA
	02		RS	RS	RS	SS
	03		RS	RS	RS	SS
	04		DF	DF	DF	DF
4124		Smokey Creek				
	01		RS	RS	RS	SS
	02		RS	RS	RS	SS
	03		RS	RS	RS	SS
	04		RS	RS	RS	SS
4151		Kinzua				
	01		DR	DR	RD	SS
	02		DR	DR	DR	SS
	03		DR	DR	DR	SS
4156		Rudio Creek				
	01		RS	RS	RS	SS
	02		RS	RS	RS	SS
	03		RS	RS	RS	SS
	04		RS	RS	RS	SS
4163		Creek				
	01		EA	EA	EA	EA

Allot. No.	Past. No.	Allotment Name	Alternatives			No Action
			Preferred	Production	Enhance	
4164		Corral Gulch				
	01		RS	RS	RS	SS
	02		RS	RS	RS	SS
	03		RS	RS	RS	SS

Key:

Grazing System Yearly sequence of use

EA	Early spring use every year
SS	Use during the critical growth period
SE	1 year SS / 1 year EA
DF	Use after seed ripe every year
DR	1 year DF / 1 year SS
RS	1 year rest / 1 year SS
RD	1 year rest / 1 year DF
RE	1 year rest / 1 year EA

Table C-3 Key Species Composition Changes Due to Implementation of Grazing Systems

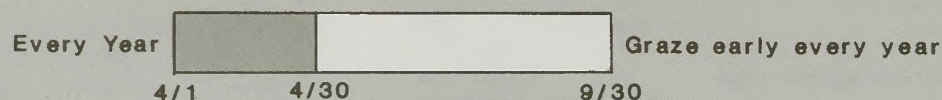
Grazing System 1/	Upland Key Species 2/				Riparian 2/ Key Species	
	Herbaceous		Woody		Herbaceous	Woody
	Light/ Moderate	Heavy	Light/ Moderate	Heavy		
Early Spring	I	I	I	I	I	I
Spring Summer	NC	D	NC	D	D	D
Deferred	I	I	NC	D	NC	D
Deferred Rotation	I	NC	NC	D	NC	D
Rest Rotation	I	NC	I	NC	NC	NC
Early Spring/Rest	I	I	I	I	I	I
Deferred/Rest	I	I	I	NC	NC	NC
Spring Summer/ Early Spring	NC	D	NC	D	D	NC

¹Grazing systems utilized in this RMP are described in Appendix. C. Composition changes shown by symbols are: I = Increase, NC = No Change, D = Decrease.

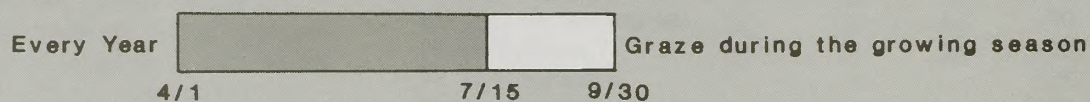
²Species represented by these sites are identified in Chapter 3.

**FIGURE C-1 EXAMPLE OF TYPICAL GRAZING SYSTEMS OF
TREATMENT BY PASTURE**

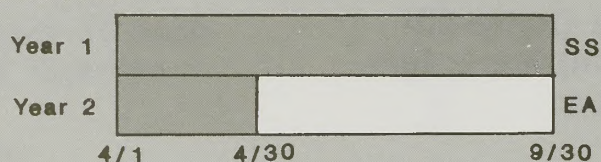
EARLY GRAZING (EA):



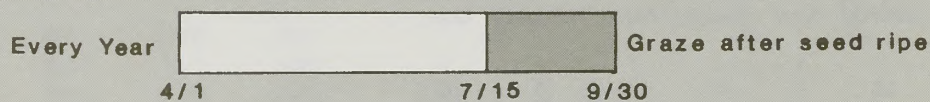
SPRING/SUMMER (SS):



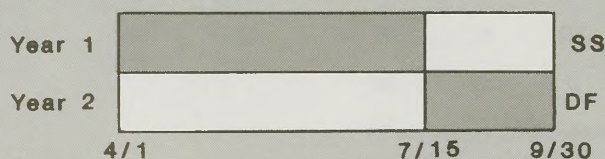
SPRING/EARLY GRAZING (SE):



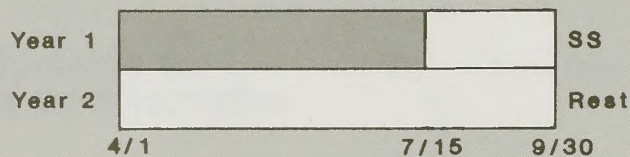
DEFERRED GRAZING (DF):



DEFERRED ROTATION GRAZING (DR):

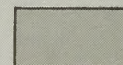


REST ROTATION GRAZING (RS):

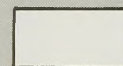


LEGEND:

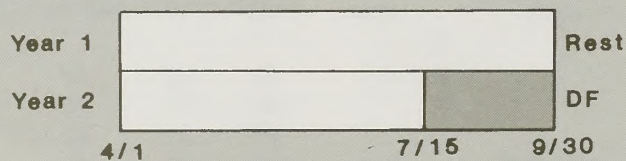
Grazing



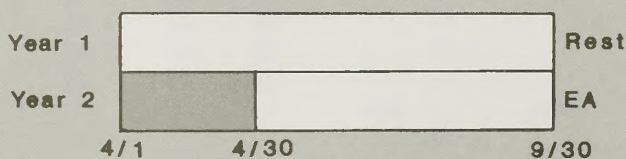
No Grazing



REST/DEFERRED GRAZING (RD):



REST/EARLY GRAZING (RE):



Appendix D Rangeland Monitoring and Evaluation

The effects of implementation will be monitored and evaluated on a periodic basis over the life of the plan. The general purposes of this monitoring and evaluation will be:

- (1) To determine if an action is fulfilling the purpose and need for which it was designed, or if there is a need for modification or termination of an action.
- (2) To discover unanticipated and/or unpredictable effects.
- (3) To determine if mitigation measures are working as prescribed.
- (4) To ensure that decisions are being implemented as scheduled.
- (5) To provide continuing evaluation of consistency with state and local plans and programs.
- (6) To provide for continuing comparison of plan benefits versus costs, including social, economic, and environmental.

A resource objective monitoring plan will be written. This plan will provide a framework for choosing the study methods that will provide the information needed to issue and implement specific management decisions which effect watershed, wildlife, and range. More specific objectives will be developed in the AMPs. These objectives are site specific and relevant to specific management applications. Monitoring efforts will focus on allotments in the Improve category.

For the range program, methodologies are available for monitoring vegetative trend, forage utilization, actual use (livestock numbers and periods of grazing), and climate. The data collected from these studies will be used to evaluate current stocking rates, to schedule pasture moves by livestock, to determine levels of forage competition, to detect changes in plant communities, and to identify patterns for forage use.

Priorities for monitoring grazing allotments will be established in the Record of Decision. The

methodology and intensity of study that is chosen for a particular allotment will be determined by the nature and severity of the resource conflicts that are present in that allotment.

For the wildlife program, monitoring will be directed at the biotic resource components using both temporary and permanent studies. The findings from these studies can be used to monitor responses in habitat condition and trend; monitor forage availability, composition, and vigor; monitor changes in cover and habitat effectiveness; and monitor habitat management objectives.

The data collected from the monitoring and evaluation process will be analyzed and fed back into the decision-making process. This will provide information regarding the effects of the land use decisions, the adequacy of mitigation methods, etc. If monitoring indicates that significant unexpected adverse impacts are occurring or that mitigating measures are not working as predicted, it may be necessary to amend or revise the AMPs. Conversely, if implementation and mitigating efforts are highly successful, monitoring and evaluation efforts may be reduced. In this case, an allotment could be reclassified from an I to an M Selective Management category (see Selective Management, Appendix E).

Appendix E Methodology Used in the Range Analysis

Methodology For Vegetative Inventory

A vegetative inventory on public land in the John Day Planning Area was conducted beginning in April of 1981 and field work was completed in October of 1981.

The data collected have been used in this document to classify sites, determine the vegetative condition of plant communities, and to make a preliminary estimate of the suitability of the land for livestock grazing.

Classification

The classification system used in site identification was the Oregon Automated Ecological Site Information System (OAESIS). This system was developed by the BLM Oregon State Office. The OAESIS guide contains range sites which were created by combining statistically similar sites from the SCS site guides for Oregon and some adjacent areas. Vegetative composition was the only criteria used for determining statistically similar sites. This system interprets the site based

upon soil characteristics, including texture and depth, and climax vegetation, to the extent that it can be interpreted for the site. The information and data concerning this system is available at the Burns District Office.

Vegetative Condition

Inventory crews first identified and delineated the boundaries of the sites to be inspected. Estimates of plant species composition, based on dry weight, were then made for the plant community found on each site. Using tables in the OAESIS guide, the present species composition was compared to the potential climax composition for the site. A condition rating was computed for the vegetation on each site. This rating represents the extent to which the site differs from potential climax. This condition rating is referred to as range condition.

Range condition is described as successional stages of plant communities. A plant community in climax stage is a community which exhibits little change in species composition when compared to the potential climax plant community for the site. Between 100 percent and 75 percent of the kinds and amounts of vegetation produced would be found in climax. Communities in late seral stage produce between 75 and 51 percent of the kinds and amounts of vegetation found in climax. Communities in mid-seral stage produce between 50 and 26 percent of the kinds and amounts of vegetation found in climax. Communities in early seral stage produce between 25 and 0 percent of the kinds and amounts of vegetation found in climax. A fifth condition class of unclassified was used in the inventory to designate areas without vegetation such as rock outcrop.

Suitability

A preliminary estimate of the suitability of each site for livestock grazing was recorded. One of two ratings was assigned to each site: suitable, no environmental factors restricting livestock access and use of the site; or unsuitable, environmental factors that cannot be changed limit livestock access or use.

The major criteria used to rate rangeland suitability was slope. In some areas, the erosion rating for the soil was also used.

Selective Management

Selective management is an ongoing process whereby allotments are categorized into three basic groups. The purpose of the categorization process is to prioritize allotments so management efforts and funding could be directed to the areas of greatest need. The three categories are I improve, M maintain, and C custodial. The

category name refers to the management objective. The objective for the I category is to improve unsatisfactory conditions; for the M category, to maintain satisfactory conditions; and for the C category, to manage in a custodial manner.

The primary criteria used in arriving at these categorizations were range condition, resource conflicts, economic feasibility of investments in range improvements and the landownership pattern as it affects BLM manageability. During the analysis of the management situation, it became evident that a portion of the Custodial allotments have potential for management provided that cooperation could be obtained from permittees. Once cooperation is attained, those respective allotments may move to the I category. Therefore, the Custodial category was further divided into C1 and C2 allotments. This subdivision allows the permittee, through increased cooperation, to gain additional resources from the Bureau. Allotments categorized as C2 would remain in custodial management. Custodial management indicates low levels of monitoring and range improvements.

As previously stated, selective management is an ongoing process whereby allotments may move from one category to the next based upon resource conditions. For example, there are presently 14 I and 3 M category allotments and the amount of I and M category allotments may change depending on resolution of resource conflicts. Given time and the ability to implement management systems, it is expected that the amount of I category allotments would decrease and the amount of M category allotments would increase.

Table E-1 Problems, Opportunities and Objectives for Grazing Management

Situation

Grazing season and selective grazing habits of different kinds of livestock can reduce the quality and quantity of vegetation produced by a plant community.

Livestock use can be poorly distributed within an allotment or pasture. This can result in heavy utilization of some sites while others may receive little or no grazing use.

Current levels of livestock use may exceed the carrying capacity of an allotment.

Some sites that are now producing a quality and quantity of forage well below their potential have a poor potential to respond to changes in grazing management alone.

Investments in range improvements needed to implement changes in grazing management often do not have favorable benefit/cost ratios.

Plant and animal pests can adversely affect livestock and vegetative productivity.

Management Action

Change the season of use and/or the class or kind of livestock.

Implement rotational grazing systems that will provide for plant maintenance requirements.

Develop new sources of water to distribute livestock more evenly.

Construct drift fences to alter traditional grazing patterns.

Specify placement of salt and mineral supplements.

Require herding livestock.

Authorize the class or kind of livestock that will best utilize the allotment.

Monitor actual livestock use and resulting levels of utilization to determine the proper carrying capacity.

Restore productivity of these sites through mechanical treatment and/or seeding with well-adapted species.

Solicit contributions from range users and other parties benefiting from changed grazing management.

Design grazing management systems that require a minimum investment in range improvements, but will meet the stated objectives.

In cooperation with other affected landowners, take actions to control concentrations of pests.

Appendix F

Determination of Existing and Predicted Range and Forage Condition and Trend

Determination of Existing Range and Forage Conditions

The determination of existing range condition was based on the relative degree to which the kinds, proportions, and amounts of plants in each plant community resemble that of the potential plant community for the site. (Procedures as outlined in the Soil Conservation Service (SCS) National Range Handbook.)

Four successional stages were used to express the degree to which the composition of the present plant community reflects that of climax. They are:

Range Condition Class	Percent of Present Plant Community that is Climax (Successional Stage) for the Range Site
Climax	76-100
Late Seral	51-75
Middle Seral	26-50
Early Seral	0-25

Determination of Predicted Range Condition

The determinations of predicted condition are based on the discussion of vegetation use and grazing systems in Appendix C. Variables such as large year-to-year fluctuations in precipitation make a precise quantification of impacts to vegetation impossible. The impact analysis methodology is a relative comparison between alternatives rather than an absolute prediction of impacts of implementing any one alternative.

The following analysis of impacts to range condition on allotment 4052 illustrates how the components of the Preferred Alternative and other alternatives would result in long-term changes in range conditions summarized in Table 4-1. This allotment is currently under a spring/summer (SS) grazing system. There is sufficient forage to sustain the level of use. Range conditions are as shown in Table F-1. Proposed range improvements called for under the Preferred Alternatives are shown in Table B-1.

Significant increases in desirable forage species are expected to result from the above proposal for three reasons:

Utilization of forage would be in a more uniform pattern due to the increased availability of stockwater, thus reducing the size of heavy use areas;

Storage of carbohydrate reserves by key herbaceous species would occur on native range under the rest rotation system.

Removal of juniper competition on 400 acres, would allow herbaceous species the opportunity to increase.

Appendix F: Current Livestock Authorization and Existing Range Condition

Allot. Number	Allotment Name	Allotment Category	Acres Public Land	Livestock Numbers	Livestock Class	Grazing Begin	Period End	NRL Percent P.L.	AUMs Active Use	Allot. Total	Percent of Surveyed Acres Range Condition			
											Late Seral	Mid-Seral	Early Seral	Unclassified or Unmapped
4001	Johnny Creek	C1	1,160	24	C	04 01	11 30	100	196					
4002	Fall Creek	C2	657	10	C	04 01	11 30	100	80					
4003	Slickear Mtn.	C2	3,274	67	C	04 01	11 01	100	537					
4004	Hamilton Mtn.	C2	160	2	C	04 01	11 01	100	20					
4005	Water Spout Gulch	C2	80	1	C	04 01	11 30	100	10					
4006	Damon Creek	C2	160	1	C	04 01	11 30	100	12					
4007	Windy Point	I	2,514	50	C	04 01	11 30	100	407		22	45	24	9
4008	Big Wall Creek	C2	40	1	C	04 01	07 01	100	4					
4009	Birch Creek	C1	3,169	46	C	04 01	11 30	100	368					
4010	Slide Creek	C2	40	1	C	04 01	11 30	100	5					
4011	C G	C2	225	3	C	04 01	11 30	100	31					
4012	River	C2	135	2	C	10 01	11 30	100	13					
4013	John Day	C2	40	1	H	04 01	11 30	100	5					
4014	Middle Fork	C2	562	9	C	04 01	11 30	100	77					
4015	Mud Springs	C2	240	5	C	05 31	10 31	100	30					
4016	Dixie	C1	2,548	39	C	04 01	11 30	100	319					
4017	Board Creek	C2	160	5	C	06 01	10 31	100	25					
4019	Rains Canyon	C2	329	5	C	04 01	11 30	100	41					
4020	Murderer's Creek	M	17,315	333	C	05 01	10 30	100	2,000		13	52	33	2
4021	Poleline	C2	160	2	C	04 01	11 30	100	21					
4022	Long Hollow	C2	80	1	C	04 01	11 30	100	8					
4023	Triple Fork	C2	320	14	S	05 01	11 30	100	20					
4025	Portuguese	C2	160	3	C	04 01	11 30	100	27					
4026	Sidehill	C2	40	1	C	06 01	10 15	100	6					
4027	Top Road	C2	79	1	C	04 01	11 30	100	9					
4028	Neal Butte	C2	712	14	C	04 01	11 30	100	119					
4029	North Fork	C2	1,894	52	C	05 01	10 31	100	316					
4030	Powersite	C2	120	2	C	04 01	11 30	100	20					
4031	Coyote Field	C2	160	2	C	04 01	11 30	100	20					
4032	Mosquito Creek	C2	80	1	C	04 01	11 30	100	6					
4033	Bullock Gulch	C2	40	1	C	04 01	11 30	100	5					
4034	Long Gulch	C2	20	1	H	04 01	11 30	100	3					
4035	Rim	C2	654	5	C	04 01	11 30	100	41					
4036	Stonehill	C2	746	13	C	04 01	10 31	100	92					
4037	Juniper	C2	400	5	H	04 01	11 30	100	40					
4038	Dayville	C2	1,640	94	C	06 01	07 13	100	141		34	39	23	4
4039	Aldrich Mtn.	C2	1,451	22	C	04 01	11 30	100	182					
4040	Poison Creek	C1	1,237	41	C	05 01	10 31	100	248					
4041	Franks Creek	C1	2,617	27	C	04 01	11 30	100	223		4	69	26	1
4042	Johnny Cake Mtn.	C2	280	3	C	04 01	11 30	100	30					
4043	Mahogany	C2	320	8	C	04 01	11 30	100	64					
4044	Soda Creek	C1	2,023	50	C	04 01	11 30	100	405		27	42	21	10
4045	Bear Gulch	C2	74	1	C	04 01	11 30	100	9					
4046	Three Mile	C2	80	1	C	04 01	11 30	100	8					
4047	Little Indian	C2	200	4	C	06 01	11 30	100	25					
4049	Battle Creek	I	4,958	10	H	04 01	11 01	100	70					
				108	C	04 01	11 01	100	760	830	15	56	28	1
4050	Jinks Creek	C2	556	11	C	04 01	11 30	100	89					
4051	Axe Gulch	C2	83	5	C	05 01	06 30	100	10					
4052	Big Baldy	I	11,132	217	C	04 01	11 30	100	1,743		28	42	26	4
4053	Oliver Fields	C2	200	5	C	04 01	11 30	100	45					
4054	Wrightman Canyon	C2	40	1	C	04 01	11 30	100	6					
4055	Mt. Vernon	C2	160	2	C	04 01	11 30	100	20					
4056	Dans Creek	C2	120	1	C	04 01	11 30	100	15					
4057	Warm Springs Creek	C2	40	1	C	04 01	11 30	100	5					
4059	Cold Springs	C2	280	4	C	04 01	11 30	100	35					
4060	Baker City	C1	640	10	C	04 01	11 30	100	80		0	25	75	0
4061	Scott Creek	C1	1,907	29	C	04 01	11 30	100	238					
4062	Warren Creek	M	640	16	C	08 01	12 31	100	80					
4063	Oxbow Fields	C2	140	1	C	04 01	11 30	100	14					
4065	East Franks Creek	C2	644	10	C	04 01	11 30	100	81					
4066	Kidd Creek	C2	1,483	23	C	04 01	11 30	100	185					
4067	Sheep Cr. Butte	C2	2,876	72	C	04 01	11 30	100	576					
4068	Sheep Gulch	I	3,499	116	C	03 01	05 15	100	292		20	22	38	20
4069	Big Springs	C2	107	3	C	04 01	09 20	100	17					

Appendix F (continued)

Allot. Number	Allotment Name	Allotment Category	Acres Public Land	Livestock Numbers	Livestock Class	Grazing Period Begin	Grazing Period End	NRL Percent P.L.	AUMs Active Use	Allot. Total	Percent of Surveyed Acres			
											Range Condition	Late	Mid- Early	Unclassified or Unmapped
4070	Fox	C2	40	1	C	04 01	11 30	100	5					
4071	Round Top	C2	360	2	C	04 01	11 30	100	20					
4072	Willow Creek	C2	80	9	C	05 01	06 01	100	9					
4073	Capsuttle Creek	C2	80	1	C	04 01	11 30	100	10					
4076	Cottonwood Creek	C1	3,113	34	C	04 01	09 30	100	204		12	39	49	0
4077	Moon Mountain	C2	240	3	C	04 01	11 30	100	30					
4078	Gibson Hill	C2	40	1	C	04 01	11 30	100	8					
4082	Jack of Clubs	C2	200	3	C	04 01	11 30	100	25					
4083	19 20	C2	160	3	C	04 01	11 30	100	26					
4084	Lower Damon	C2	240	4	H	04 01	11 30	100	36					
4085	Barber Pole Butte	C2	560	3	C	11 01	06 01	100	28					
4086	Rudio Mtn.	I	3,860	227	C	07 01	10 15	74	590		47	50	1	2
4087	Blue Basin	C2	966	27	C	04 01	11 30	100	220					
4089	East Monument	C2	413	6	C	04 01	11 30	100	52					
4090	Magpie Creek	C2	80	1	C	04 01	11 30	100	11					
4091	Juniper Ridge	C2	80	1	C	04 01	11 30	100	10					
4092	Little Beach	C2	360	5	C	04 01	11 30	100	45					
4093	West Bologna Creek	C2	80	6	C	05 01	06 30	100	12					
4094	Dry Creek	C2	200	3	C	04 01	11 30	100	25					
4095	Fields Creek	C2	1,092	61	C	06 01	09 15	100	214					
4096	Hi Desert	C2	400	10	C	04 01	11 30	100	80					
4097	Trout Creek	I	2,839	113	C	05 01	09 30	100	568					
4098	East Creek-Pine Hill	I	1,840	62	C	04 01	09 30	100	374					
4099	Indian	C2	40	1	C	04 01	11 30	100	5					
4100	Bobcat	C2	160	5	C	07 01	10 31	100	20					
4101	Lower Cupper	C2	233	4	C	04 01	11 30	100	39					
4102	Prospector	C2	160	2	C	04 01	11 30	100	20					
4103	Rockpile	I	4,918	108	C	04 01	11 30	100	870					
				14	H	05 01	11 30	100	59	928	15	56	25	4
4104	South Fork	C2	1,075	26	C	04 01	11 30	100	215					
4105	Pyramid Point	C2	1,001	25	C	04 01	11 30	100	200					
4106	Izee	C1	1,200	30	C	04 01	11 30	100	240					
4107	Canyon Terrace	C2	158	2	C	04 01	11 30	100	20					
4108	Little Wall Creek	C2	320	6	C	04 01	11 30	100	53					
4109	Big Canyon Creek	C2	146	2	C	05 01	11 30	100	20					
4110	Funny Butte	C2	1,042	54	C	06 01	10 01	100	216					
4111	Dustin Point	C2	520	4	C	05 01	09 30	100	23					
4112	Cottonwood Forks	C1	1,558	24	C	11 01	06 15	100	194					
4113	Courthouse Rock	C2	480	11	C	06 01	11 01	100	55					
4114	Long Creek Mtn.	C2	120	1	C	04 01	11 30	100	15					
4115	Canyon Mtn.	C2	135	2	C	04 01	11 30	100	17					
4116	Small Pasture	C2	2	1	C	04 01	04 30	100	1					
4118	Beech Creek	C1	1,119	20	C	05 01	11 30	100	140					
4119	Black Canyon	C2	944	23	C	04 01	11 30	100	188					
4120	Ferris Creek	I	3,177	37	C	04 15	11 30	100	280		15	33	47	5
4121	Airport	C2	320	5	C	04 01	11 30	100	40					
4122	Big Bend	C2	280	3	C	04 01	11 30	100	25					
4123	Canyon	C2	160	1	C	04 01	11 30	100	11					
4124	Smokey Creek	I	2,213	61	C	07 01	11 30	100	307		50	22	13	15
4125	Umatilla	C2	679	14	C	04 01	11 30	100	113					
4126	Abrahams Draw	C2	40	1	C	06 01	11 30	100	8					
4127	Kimberly	C2	240	5	C	04 01	11 30	100	40					
4128	Cummings Creek	C2	160	2	C	04 01	11 30	100	20					
4129	Belshaw Creek	C2	642	10	C	04 01	11 30	100	80					
4130	Marks Creek	C2	80	5	C	05 01	06 01	100	5					
4131	Day Creek	C1	1,583	22	C	04 01	10 31	100	160		13	45	41	1
4132	Whiskey Gulch	C2	455	8	C	05 01	11 01	100	56					
4133	Vaughn	C2	453	6	C	04 01	11 30	100	55					
4134	Lookout	C2	119	3	C	05 01	10 01	100	15					
4135	Gibson Creek	C2	120	2	C	04 01	11 30	100	20					
4136	Baldwin Gulch	C2	320	6	C	04 01	11 30	100	53					
4138	White	C2	80	2	C	05 01	08 31	100	10					
4139	Bone Yard	C2	1,480	21	C	05 01	11 30	100	148					
4140	Shirt Tail Creek	C2	40	1	C	05 01	11 30	100	8					
4141	Pine Creek	C2	335	5	C	04 01	11 30	100	30	47				
4143	Silvies	M	11,035	357	C	05 01	11 30	100	2,500					
4144	Wyllie	C2	40	1	C	04 01	11 30	100	5					
4145	Two County	C1	13,796	138	C	04 01	11 30	100	1,105		33	34	21	12
4151	Kinzua	I	9,493	195	C	05 01	10 31	100	1,170					
4154	Morgan Creek	C1	1,847	46	C	04 01	11 30	100	370		35	55	10	0

Appendix F (continued)

Allot. Number	Allotment Name	Allotment Category	Acres Public Land	Livestock Numbers	Livestock Class	Grazing Begin	Period End	NRL Percent P.L.	AUMs Active Use	Allot. Total	Percent of Surveyed Acres			
											Range Condition			
											Late Seral	Mid-Seral	Early Seral	Unclassified or Unmapped
4155	Blackhorse Draw	C1	2,698	67	C	04 01	11 30	100	540					
4156	Rudio Creek	I	2,328	46	C	04 01	11 30	100	369		14	48	13	25
4157	Keeny Point	C2	40	1	C	04 01	08 31	100	5					
4158	Fall Mtn.	C2	280	8	C	08 01	11 30	100	35					
4159	Miller Mtn.	C2	680	21	C	08 01	11 30	100	85					
4160	Bologna Creek	C2	440	4	C	04 01	11 30	100	37					
4161	Dean Creek	C2	40	1	C	07 01	09 30	100	5					
4163	Creek	I	706	96	C	04 10	04 25	100	51		2	91	7	0
4164	Corral Gulch	I	2,653	212	C	05 01	06 15	060	318		0	38	53	9
4167	Quarry	C2	200	10	C	04 01	06 01	100	20					
4168	Grub Creek	C2	80	1	C	05 01	10 31	100	10					
4172	Cummings Fork	C2	320	5	C	04 01	11 30	100	40					
4173	Eagle Rock	C2	160	2	C	04 01	11 30	100	16					
4174	Reynolds Creek	C2	157	1	C	04 01	11 30	100	10					
4175	Boulder	C2	40	1	C	05 01	11 30	100	5					
4176	Dick Creek	C1	1,000	28	C	04 01	11 30	100	227					
4177	Clark Creek	C2	483	6	H	10 01	07 30	100	60					
4178	Cheatgrass	C2	40	20	S	05 15	06 15	100	4					
4180	King Mtn.	C2	160	5	C	06 01	08 30	100	16					
4181	Dog Cr. Ridge	C2	120	2	C	06 01	09 01	100	8					
4183	OSUF	C2	160	1	C	05 01	11 30	100	10	16				
4184	Pass Creek	C2	80	1	C	04 01	11 30	100	10					
4185	Cockran Creek	C2	160	3	C	05 01	10 31	100	16					
4186	Big Flats	C1	3,637	10	H	04 15	11 30	100	84					
				44	C	04 15	11 30	100	350	927	4	14	14	68
4300	Unleased		3,679								5	6	0	89

Appendix G General Best Forest Management Practices

The following Best Forest Management Practices (BFMP) are taken from the Oregon Statewide Planning Manuals and the Oregon Forest Practice Rules (Oregon Department of Forestry 1980). Generally, BFMP applications were selected to avoid rather than mitigate impacts. In addition, all road standards and designs will correspond to BLM Manual 9113.

Road System

Logging road locations, particularly on sensitive areas, should be evaluated by a forester, soil scientist, wildlife biologist, and other specialists as needed. The location should be fitted to the topography to minimize cut and fill situations. In areas of important big game habitat, consultation with the wildlife biologist will be necessary to reduce impacts on wildlife, particularly in areas such as ridgelines, saddles, and upper drainage heads. Where alternative locations are not possible, incorporate mitigating measures into road development plans. Avoid stream crossings, if possible. If not possible, minimize approach cuts and fills and channel disturbance, and maintain stream bank vegetation.

Do not locate stream crossings strictly on a grade basis. Choose a stable site and adjust grade to it, when possible.

Keep stream disturbance to an absolute minimum.

If necessary, include short road segments with steeper grades, consistent with traffic needs and safety, to avoid problem areas or to take advantage of terrain features.

For timber harvest spur roads, take advantage of natural landing areas (flatter, better drained, open areas) to reduce soil disturbance associated with log landings and temporary work roads.

Vary road grades where possible to reduce concentrated flow in road drainage ditches and to reduce erosion on road surfaces.

Design drainage ditches, water bars, drain dips, culvert placement, etc., in a manner that will disperse runoff and minimize cut and fill erosion.

Install culverts or drain dips frequently enough to avoid accumulations of water that will cause erosion of road ditches and the area below the culvert and drain dip outlets.

Seed (revegetate) cuts and fills the first fall season following disturbance.

Deposit excess material in stable locations well above the high water level and never into the stream channel. Do not allow any material, including sidecast soil, stumps, logs, or other material to be deposited into a stream.

Plan ditch gradients steep enough (generally greater than 2%) to prevent sediment deposition.

When installing culverts and drain dips, avoid changes in channel orientation and place these structures to conform to the natural channel gradient. Design culverts for maximum stream flow (e.g., 25-year discharge).

Skew culverts approximately 30 degrees toward the inflow to provide better inlet efficiency.

Provide rock or other basins at the outlet of culverts and rock the drain dips if economically feasible.

In some areas, alternating inslope and outslope sections can be built into the road, especially if road grades are rolled to dispose of road surface flow.

Obtain all necessary permits for stream crossings before beginning activities.

Maintain all roads immediately after logging and the primary roads whenever necessary by cleaning ditch lines, blading debris from empty landings, trimming damaged culvert ends, and cleaning out culvert openings.

Grade the primary road surfaces as often as necessary to retain the original surface drainage (either insloped or outsloped). Take care to avoid casting graded material over the fill slope. Monitor surface drainage during wet periods and close the road if necessary to avoid undue damage.

Haul all excess material removed by maintenance operations to safe disposal areas. Apply stabilization measures on disposal sites if necessary to assure that erosion and sedimentation do not occur.

Vary the steepness of slopes on cut and fill slopes commensurate with the strength of the soil and bedrock material as established by an engineering geologist or other specialist in soil mechanics.

Control roadside brush only to the extent required for good road maintenance.

Silvicultural

Time logging activities to the season in which soil damage can be kept to acceptable limits.

Design and locate skid trail and skidding operations to avoid across ridge and across drainage operation, and to minimize soil compaction.

Install water bars on skid trails when logging is finished (forester and/or soil scientist will provide assistance as requested or needed).

Avoid trapping and turning small streams out of their natural beds into tractor trails and landings.

Confine tractor skidding operations to slopes of less than 35 percent. Leave appropriate snags and/or large dead trees for wildlife, as per current BLM Snag Management Policy Guidelines and Agriculture Handbook No. 553 (USDA 1979).

If debris should enter any stream, such debris shall be removed concurrently with the yarding operation and before removal of equipment from the project site. Removal of debris shall be accomplished in such a manner that natural streambed conditions and streambank vegetation are not disturbed.

Provide appropriate width buffer strips adjacent to perennial streams, springs, and wet meadows. Logging techniques in riparian areas in non perennial streams would be designed to minimize the amount of sediment-laden overland flow that reaches perennial stream channels. Avoid logging across any stream supporting fisheries.

Reforest all cutover lands with a commercial species to minimum stocking levels (100-150 trees/acre within 5-15 years. The differences in stocking level numbers are related to the differences in site class. For more detail refer to the BLM TPCC Manual 5250.

Slash disposal will be done in a manner conducive to revegetation and advantageous to wildlife. Slash

will be burned when necessary and such burning will be in conformance with state air pollution regulations.

Logging units will be laid out in a manner that would reduce the risk of windthrow. The selection of trees in shelterwoods will be made in a manner that would improve the genetic composition of the reforested stand. Disturbed areas will be artificially reforested when natural forest regeneration cannot be reasonably expected in 5-15 years.

Yarding practices to be employed during the planning period consist of tractor systems, ground and partial suspension cable systems, and full suspension systems which include cable and aerial. Each system impacts ground vegetation to different degrees relative to the soil disturbance resulting from the harvest system used. For example, the tractor system would cause the greatest impact to existing vegetation and an aerial full suspension system would cause the least disturbance.

Appendix H: Wildlife and Fish Resource Data and Methods

Table H-1 Habitat Condition and Trend, Rainbow Trout (*Salmo gairdneri*), John Day RMP Area

Stream Name	Stream		Condition			Trend	Species
	Miles	Poor	Fair	Good	Excel.		
John Day River	2.80	1.85	.95			S	Rb,ChS,StS,DV SB,CC,BrB,NG
N.Fork John Day	14.07		13.57	.50		S	Rb,ChS,StS,DV SB,CC,BrB,NG
Rudio Creek	3.55	1.50	2.05			S	Rb,StS,NG
Gilmore Creek	.60	.60				D	Rb,StS,NG
Straight Creek	.30	.30				D	Rb,NG
Cottonwood Cr	.65		.65			S	Rb,Sts,SB,CC,NG
Squaw Creek	1.50	1.50				U	Rb,StS,NG
Middle Fork							
John Day River	1.45	.20	1.25			U	Rb,StS,Chs,NG,DV
Cole Canyon	.60	.60				S	Rb,NG
Long Creek	.30	.30				U	Rb,StS,NG
Mallory Creek	.25	.25				S	Rb,StS,NG
Graves Creek	.15	.15				S	Rb, Sts, NG
Potamus Creek	.25	.25				S	Rb, Sts, NG
Sulphur Gulch	.30	.30				S	Rb,NG
Rattlesnake Cr	.35	.35				S	Rb,NG
Cottonwood Creek	1.50		1.50			D	Rb,StS,NG
Battle Creek	2.00	2.00				S	Rb,NG
S. Fork John							
Day River	14.45	3.60	8.80	2.05		S	Rb,StS,NG
Murderer's Cr	.20		.20			S	Rb,StS,NG
Cabin Creek	.45		.45			S	Rb,NG
Frazier Creek	1.00	.50	.25			S	Rb,StS,NG
Martin Creek	.25	.25				S	Rb,NG
Deer Creek	2.90	.25	2.65			U	Rb,StS,NG
Sunflower Creek	.85	.25	.60			S	Rb,NG

Wildcat Creek	.25	.25				S	Rb,NG
Tamarack Creek	.25	.25				S	Rb,NG
Flat Creek	1.10	1.10				D	Rb,NG
Utley Creek	.60	.60				D	Rb,NG
Delles Creek	.50	.50				S	Rb,NG
Canyon Creek	1.45		1.45			S	Rb,CtY,StS,BT NG
E. Fork Pine Cr	.15	.15				S	Rb,StS,NG
W. Fork Pine Cr	.45	.45				S	Rb,StS,NG
Indian Creek	.45	.45				S	Rb,StS,NG
Dixie Creek	2.10	1.15	.65	.30		U	Rb,StS,NG
Standard Creek	.90	.65	.25			S	Rb,StS,NG
E. Fork Standard		.65	.65			S	Rb,StS,NG
Dad's Creek	.30	.30				S	Rb,StS,NG
Silvies River	.20	.20				S	NG
Jump Creek	.30		.30			S	Rb,NG
Flat Creek	.40	.40				S	Rb,NG
Mountain Creek	.50	.50				S	Rb,NG
TOTALS		20.85	36.37	3.55	0.00		
%		34	60	6	0		

Key to Symbols:

Rb-Rainbow Trout
StS-Summer Steelhead
Chs-Spring Chinook Salmon
CtY-Yellowstone Cutthroat Trout
DV-Dolly Varden
BT-Brook Trout

SB-Smallmouth Bass
CC-Channel Catfish
BrB-Brown Bullhead
NG-Nongame
S = Stable
D = Downward
U = Upward

Table H-2 Population Status of Fishes of the John Day RMP Area.

Species	Population Origin	Population Trend	Relative Abundance	Sensitive Species
Spring Chinook Salmon	N	Downward	Common	No
Coho Salmon	N	No longer present	No longer	No
Summer Steelhead	N	Downward	Common	No
Redband Rainbow Trout	N	Stable	Abundant	Yes (Oregon)
Brook Trout	I	Stable	Common*	No
Yellowstone Cutthroat	I	Stable	Rare	No
Dolly Varden	N	Stable	Common*	No
Mountain Whitefish	N	Stable	Common	No
Smallmouth Bass	I	Upward	Common*	No
Channel Catfish	I	Upward	Common*	No
Black Bullhead	I	Stable	Rare	No
Brown Bullhead	I	Stable	Rare	No
Carp	I	Stable	Common*	No
Chiselmouth	N	Stable	Common	No
Northern Squawfish	N	Stable	Common	No
Largescale Sucker	N	Stable	Common	No
Bridgelip Sucker	N	Stable	Common	No
Mountain Sucker	N	Stable	Common	No
Mottled Sculpin	N	Stable	Common	No
Torrent Sculpin	N	Stable	Common	No
Piute Sculpin	N	Stable	Common	No
Shorthead Sculpin	N	Stable	Common	No
Redside Shiner	N	Stable	Common	No
Longnose Dace	N	Stable	Common	No
Speckled Dace	N	Stable	Common	No
Pacific Lamprey	N	Stable	Common	No
Pacific Brook Lamprey	N	Stable	Common	No

N = Native, I = Introduced
*Selected Stream

Table H-4 Summer Steelhead Redd Counts for Selected Streams in the John Day RMP Area (Redd/Mile)

Stream Name	1975	1976	1977	1978	1979	1980	1981	1982
Canyon Creek	—	10.0	20.0	7.6	1.8	3.6	—	—
Cottonwood Creek	5.6	3.2	0	2.7	0	0.8	—	—
Deer Creek	10.2	4.7	—	3.8	0.5	2.8	1.4*	3.0*
Murderer's Creek (lower portion)	18.7	13.7	5.0	2.5	—	2.0	—	—
Indian Creek	—	—	0	3.5	—	2.5	—	—
Rudio Creek	—	—	—	—	—	1.0	—	4.5*
Standard Creek	—	—	—	—	—	—	2.4*	2.7*
Dixie Creek	—	—	—	—	—	—	0.9*	3.3*

*BLM Administered reaches only.

Table H-3 Electroshocking Data for Selected Streams in the John Day RMP Area.

Stream Name	Year	No. Per Mile	Mean Fork Length (inches)	Median Fork Length (inches)	Mode Fork Length (inches)
Deer Creek	1981	3503	3.17	4.25	2.00
	1982	3931	3.01	3.64	1.87
Murderer's Creek	1980	3635	4.80	3.50	4.25
	1981	3759	4.86	5.50	4.50
	1982	3131	3.59	4.72	2.66
Cottonwood Creek (near Dayville)	1973	4268	3.58	4.00	4.00
	1974	6413	2.84	4.25	2.50
	1975	5896	2.43	3.38	2.00

Excellent Stream habitat virtually unchanged from natural conditions or is highly productive for aquatic life; trout production at potential.

Riparian Inventory

Methods

During the summer of 1980 and 1981 BLM personnel collected field data from riparian areas along

public streams in the John Day Planning Area. Some of the data included: miles of stream, acres of riparian habitat, plant utilization, species composition (particularly trees and shrubs), type of plant community, understory vegetation, percent cover, slope, height categories of trees and wildlife observations. A narrative for each stream segment describes livestock and wildlife impacts, stream channel damage, recreational use, plant reproduction, apparent habitat trend and management recommendations. Photographs were taken at most stream segments.

Rating System

Condition of habitat for wildlife was rated as excellent, good, fair or poor. As with any rating system, the selection of condition classes is subjective and reflects the biologists professional opinion. Habitat potential was an important factor in rating condition. Sparsely vegetated areas which once supported dense growths of trees, shrubs and grasses would be rated poor or fair. Positive and negative factors affecting wildlife were listed to help make condition class selection. Data are on file in the Burns District Office.

Criteria for Evaluating Stream Conditions

Stream fisheries habitat ratings were obtained by walking along streams and documenting their physical and biological characteristics every one-quarter mile. Some factors measured and rated were channel stability, stream bank damage, physical habitat condition, water quality and aquatic insects. Each one-quarter mile section was given an overall rating, based on measurements and observations.

Habitat

Quality	Definition
Poor	Natural stream habitat drastically altered; very little or no present trout production.
Fair	Stream substantially altered from natural conditions due to past or present activities, habitat either partially recovered or still decreasing in trend; some trout production but population is far below potential for streams.
Good	Stream only slightly altered from natural conditions, very limited habitat changes or almost complete recovery; satisfactory trout population for stream.

Table H-5 Water Quality and Discharge Data for Selected Streams in the John Day RMP Area

Stream Name	Date	Dis-charge (cfs)	Air Temp (°C)	Water Temp (°C)	Conduc-tivity micromhos/cm	Alkalinity (ppm CaCO ₃)	Total Hardness (ppm CaCO ₃)	PH	NO ₄ (ppm)	SO ₄ (ppn)	Dissol. Oxygen (ppm)	Tur-bidity (FTU)	Color (Units)	Copper (ppm)
Deer Creek	06/15/82	20.7	28.0	14.5	285	508	223	8.9	0.10	17	7.0	1	10	---
	07/22/82	7.0	16.5	12.0	360	492	---	8.6	0.40	15	9.0	5	5	0.17
	08/12/82	3.95	26.0	14.0	370	192	165	7.8	0.35	14	9.0	0	0	0.25
Murderer's Creek	06/15/82	79.1	28.5	14.0	230	370	138	8.4	0.20	12	7.0	5	10	---
	07/22/82	10.8	27.0	22.5	300	408	---	8.1	0.50	7	8.0	10	10	0.25
	08/12/82	79.0	23.5	14.0	235	154	115	8.2	0.60	10	9.0	10	20	0.22
Indian Creek (S Fork JD Riv)	06/15/82	1.1	30.0	16.0	440	554	300	7.9	0.20	120	7.0	2	10	---
	07/22/82	0.6	16.5	9.0	438	546	---	7.7	1.00	125	10.0	5	0	0.35
	08/12/82	0.33	28.5	15.9	500	162	238	7.5	0.75	120	8.0	2	0	0.20
S Fork JD River	08/12/82	---	23.5	15.9	310	154	154	7.8	0.75	18	9.0	5	10	0.10
Dixie Creek	11/24/81	1.35	1.0	1.0	195	---	146	8.2	0.80	--	10.0	5	30	---
	04/22/82	28.7	13.0	2.7	---	223	100	8.2	0.60	8	11.0	30	90	0.05
	06/23/82	8.11	17.5	9.0	160	185	100	7.9	0.60	5	9.0	5	20	0.25
	07/20/82	3.42	28.5	12.0	205	331	146	8.4	0.40	9	9.0	5	10	0.25
Standard Creek	11/24/81	1.04	1.0	3.0	180	---	131	8.1	0.0	--	10.0	5	20	---
	04/22/82	17.4	18.0	6.0	---	208	115	8.5	0.70	8	12.0	10	30	0.30
	06/23/82	4.40	24.0	12.0	160	215	108	7.8	0.45	17	8.0	1	1	0.25
	07/20/82	2.53	25.5	13.0	190	208	---	7.4	0.30	22	13.0	0	0	0.15
	08/24/82	0.90	36.0	14.0	210	92	65	7.7	2.40	27	--	2	0	0.20

Appendix I

Estimates of Gross Sales, Personal Income, and Employment

These measures of the economic effects of changes in program-related activities were estimated by use of an input-output model (IMPLAN) developed by the U.S. Forest Service, with which BLM developed the model representing the economy of Grant County.

An interindustry (or input-output) model is a summary of all the transactions occurring in an area during a 1-year period, showing for each industry or economic sector the amount of its purchases from every other industry (inputs) and the amount of its sales to every other industry (outputs). Purchases of goods to be sold by trade industries are treated as direct sales by the producing industry, and trade industry transactions are limited to their gross margin accounts or the part of their transactions over and above the cost of goods sold. This information represents the interindustry relationships in the area and permits the estimation of how a change in one industry would affect other industries and the economy as a whole.

When a specific change occurs in the economy, such as an increase in cattle sales due to increased forage availability, the cattle industry purchases more than its suppliers, ranch families spend more, and so on. Recipients of these purchases increase their purchases. The end result of this process is increased activity throughout the economy. The effects on the industry in which the initial change occurs (e.g., the cattle industry) are termed the direct effects of the change. The direct effects plus

the effects on other industries in the local economy make up the total local effects. Estimates of the effects per unit measure are shown in Table I-1 for the resource activities significantly affected by the potential program actions.

Table I-1 Economic Effects Per Unit Measure *

Item	Initial Unit of Measure	Direct Gross Sales**	Direct Personal Income	Direct Employment (Jobs)	Total Personal Income	Total Employment (Jobs)
Livestock Production	1,000 AUMs	\$18,080	2,830	.11910	8,600	.337100
Range Improvements	\$1,000	1,000	406.3	.02701	683.3	.041830
Timber Production	MBF	393.19	135.1	.00486	254.5	.009960
Big Game Hunting	RVD	16.03			9.65	.000497
Waterfowl Hunting	RVD	19.78			12.09	.000628
Upland & Small Game Hunting	RVD	23.51			15.99	.000909
Fishing	RVD	16.77			10.95	.000572
Recreation Day Use	RVD	39.06			23.01	.001130
Camping	RVD	10.65			6.03	.000305

*Derived from inter-industry model for Grant County.

** Total sales (or expenditures) per unit in 1982 dollars. Livestock sales per AUM derived from ranch budget survey for BLM permittees in Grant County. Refer to Table I-2 for source of \$18,080.

Table I-2 Personal Income Generated per AUM for Beef Production, Grant County, 1976-1981
(Data in Thousands Except as Otherwise Indicated)

Item	1976	1977	1978	1979	1980	1981	Average
1. Direct personal income in agriculture ¹	3,216.00	1,976.00	4,537.00	5,922.00	6,712.00	--	
2. Value of agricultural commodities sold ²	7,539.00	7,697.00	10,293.00	13,782.00	12,771.00	14,092.00	
3. Value of cattle and calves sold ³	6,033.00	6,141.00	8,003.00	11,400.00	9,763.00	9,268.00	
4. Direct personal income in agriculture attributable to beef production ⁴	2,569.00	1,577.00	3,528.00	4,898.00	5,131.00	--	
5. Number cattle and calves ³	50	54	54	60	62	65	
6. Number of beef cows ³	28.5	27.5	29	29	31.5	33	
7. Number of dairy cows ³	--	--	--	--	--	--	
8. Total AUMs for beef cattle ⁵	471	489	498	534	561	588	524
9. Value of cattle and calves sold per AUM for beef cattle (in dollars) (item 3 divided by item 8)							
-- in current dollars	12.80	12.55	16.07	17.98	17.40	15.76	15.43
-- in 1982 dollars ⁶	19.07	18.70	18.80	17.80	17.75	16.39	18.08 ⁸

¹ Consists of all wages and other labor income and proprietors income in the agricultural industry. U.S. Dept. of Commerce Bureau of Economic Analysis, Regional Economic Information System, Table 5, April 1982.

² Consists of all sales of crops, livestock and livestock products. Oregon State University, Extension Service, Commodity Data Sheets, 1982.

³ Oregon State University, Extension Service, Commodity Data Sheets, 1982.

⁴ Derived by multiplying the ratio of cattle and calf sales to total sales (item 3 divided by item 2) by total income (item 1).

⁵ Estimated as 12 times the number of beef and dairy cows plus six times the number of beef calves: 12 (item 6 ÷ item 7) = 6 X .50 (item 5 - item 6 - item 7).

⁶ Adjusted by the producer price index (farm products - livestock): 1976 - 1.49; 1977 - 1.49; 1978 - 1.17; 1979 - .99; 1980 - 1.02; 1981 - 1.04.

Appendix J Habitat Management Techniques

Riparian habitat needs will be taken into consideration in developing livestock grazing systems and pasture designs. Some of the techniques that can be used to lessen impacts are:

management activities in riparian zones will be designed to maintain or, where possible, improve riparian habitat condition;

changing class of stock from cow/calf pairs to herded sheep or yearlings;

either eliminating hot season grazing (i.e., grazing during the hottest part of summer) or scheduling hot season grazing on a rotational basis (e.g., only one year out of every three);

locating salt away from riparian zones;

laying out pasture fences so that each pasture has as much riparian habitat as possible;

locating fences so that they do not confine or concentrate livestock near the riparian zone;

developing alternative sources of water to lessen the grazing pressure on the riparian habitat; and

as a last resort, excluding livestock completely from riparian by protective fencing.

Where applicable, the following management tools may be used to alleviate wildlife habitat conflicts that may occur:

managing public vehicle access to maintain the habitat effectiveness of security cover and key seasonal habitat (such as winter range) for deer and elk;

Roads and utility corridors will avoid riparian zones to the extent practicable;

maintaining adequate untreated peripheral zones around important moist-sites (i.e. wet sedge meadows, springs, riparian zones);

maintaining adequate thermal and security cover on deer and elk habitat, particularly within timber stands adjacent to primary winter foraging areas;

Appendix K Criteria for Land Ownership Adjustment

Specific criteria exist for use in categorizing public land for retention or disposal, and for identifying acquisition priorities.

This list is not considered all-inclusive, but represents the major factors to be evaluated. These criteria may be modified in the future to assure consistency. The criteria to be used are public resource values, including but not limited to:

Threatened or Endangered plant and animal species habitat;
riparian area;
fisheries;
nesting/breeding habitat for game animals;
key big game seasonal habitat;
developed recreation sites and recreation access;
Class A scenery;
municipal watersheds;
energy and mineral potential;
significant cultural resources and sites eligible for inclusion on the National Register of Historic Places;
wilderness and areas being studied for wilderness;
accessibility of the land for public uses;
amount of public investments in facilities or improvements and the potential for recovering those investments;
difficulty or cost of administration (manageability);
suitability of the land for management by another federal agency;
significance of the decision in stabilizing business, social and economic conditions, and/or lifestyles;
whether private sites exist for the proposed use;

encumbrances, including but not limited to;
withdrawals, or existing leases or permits;
consistency with cooperative agreements and plans or policies of other agencies; and

suitability (need for change in land ownership or use) for purposes including but not limited to community expansion or economic development, such as industrial, residential, or agricultural (other than grazing) development.

The land ownership adjustment criteria identified above will be considered in land reports and environmental analyses prepared for specific adjustment proposals.

Transfers to other public agencies will be considered where improved management efficiency would result. Minor adjustments involving sales or exchanges or both may be permitted based on site-specific application of the land ownership adjustment criteria.

Land to be acquired by the BLM through exchanges, generally, must:

facilitate access to public land and resources, or maintain or enhance important public values and uses, or
maintain or enhance local social and economic values in public ownership, or
facilitate implementation of other aspects of the John Ray RMP.

Public land to be sold must meet the following disposal criteria derived from the Federal Land Policy and Management Act:

such land must be difficult and uneconomic to manage as part of the public lands, and must not be suitable for management by another federal department or agency;

such land must have been acquired for a specific purpose and must no longer be required for that or any other federal purpose; or

disposal of such land will serve important public objectives that can only be achieved prudently or feasibly if the land is removed from public ownership, and if these objectives outweigh other public objectives and values that would be served by maintaining such land in federal ownership.



Generally, exchanges are the preferred method of disposal but sale will be utilized when:

it is required by national policy;

it is required to achieve disposal objectives on a timely basis, and where disposal through exchange would cause unacceptable delays;

the level of interest in a specific tract indicates that competitive bidding is desirable for reasons of fairness; or

disposal through exchange is not feasible.

The preferred method of selling public land will be by competitive bidding at public auction to qualifying purchasers. However, modified competitive bidding procedures may be used when there is not legal public access to a tract, when necessary to avoid jeopardizing an existing use on adjacent land, or to avoid dislocation of existing public land users.

Public land may be sold by direct sale at fair market value when:

such land is needed by state or local governments;

direct sale is needed to protect equities arising from authorized use;

direct sale is needed to protect equities resulting from inadvertent, unauthorized use that was caused by surveying errors or title defects; or

there is only one adjacent landowner and no legal public access.

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